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Marine Diesel Engine

Insert section of the

November 1932 Issue

Marine Review

New York **London** **Cleveland**

THE DIESEL ENGINE,

Application in American Vessels

BY A. H. JANSSON

THOUGH the United States ranks third among the maritime nations of the world in the ownership and operation of seagoing motorships, not a single installation of this kind has been made during the current year. A report recently issued by the shipping board states that at the end of 1931 in vessels of 2000 gross tons and over, the United States had a total of 84 motor ships aggregating 544,673 gross tons, while Great Britain had 364 motor ships of 2,621,914 gross tons and Norway had 276 motor ships of a total tonnage of 1,651,407.

The world total in this category was 1275 vessels with an aggregate gross tonnage of 8,510,634. Netherlands, which stands fourth with 83 vessels of 623,065 gross tons exceeds the United States in tonnage. In number of motor vessels Sweden also ranks fourth with 83, but of the lesser total tonnage of 497,641 gross tons. The rank of other nations in number of motorships follow: Germany, fifth, with 79 ships of a total gross tonnage of 533,385; Denmark, sixth, with 67 ships of 392,277 gross tons; Japan, seventh, with 65 ships of 461,472 tons; Italy, eighth, with 56 ships of 401,807 tons; Spain, ninth, with 25 ships of 141,580 tons; France, tenth, with 18 ships of 145,228 tons and all other nations 75 motorships of 496,185 tons.

Motorship construction in the United States, however, has not been as active in latter years as in the other principal maritime countries. In the number of motor vessels constructed during the last four and a half years, the position of United States is eighth, being outranked by all of the principal maritime countries, except Italy, France and Spain.

So much for statistics. The plain facts are that the United States is undoubtedly on par or ahead of all other nations in the application of the marine diesel engine in smaller vessels requiring 1500 horsepower and less. In moderate sized ocean-going vessels as can be seen from the figures quoted, the position of the United States, though far behind that of Great Britain and Norway, compares well with other nations.

In much larger units, however, the diesel has not been used in the United States. In not a single one of the great fleet of combination passenger and freight vessels built during the past two and a half years has the diesel engine been installed for propelling power. They have all been steam, either turbine electric or turbine geared drive. In the meantime, other nations have brought out large passenger motorships like Great Britain's BRITANNIC and GEORGIC of 20,000 horsepower in twin screws; the Italian passenger motorships NEPTUNIA and sister ship OCEANIA, of 18,000 horsepower in four engines, and the cabin passenger ship LAFAYETTE of the French line; to mention only a few of the recently built outstanding large ocean-going diesel propelled foreign passenger ships.

Under present conditions it is difficult to see much opportunity in the immediate future to try out the American marine diesel engine in this larger class of vessel. In engines up to 4000 horsepower, possibly 5000, the outlook is different. A program of freight liners must soon be undertaken.

The satisfactory performance of the motorship, CITY OF NEW YORK, of 8272 gross tons with two engines each rated at 2700 brake horsepower, is an excellent recommendation for this type of power. In two and a half years of continuous operation, this vessel is reported to have had no forced stop at sea, and with a total cost of machinery repairs in that time of less than $500. The tanker DAYLIGHT completed in June, 1931, has also had an exceptional record of a satisfactory service. She recently completed a period of operation in which her main engine operated continuously for 123½ days, covering a distance of 30,390 miles, without a forced stop of any kind. This tanker, with a deadweight capacity of 14,593 tons, averaged a fuel consumption of 11½ tons per day. The motorship, CITY OF ELWOOD, operated in the New York to India service by the Pioneer line, recently made a fast run from New York to Karachi in less than twenty-six days. This vessel is one of the second group converted by the shipping board and operates on an average of 15.72 tons of fuel per day. She has a deadweight of 9116 tons and her horsepower is

slightly over 4000 and she operates at an averaged speed of 12.2 knots.

It is evident from the above that there need be no longer any uncertainty about the dependability in service of the American built diesel engine. With this assurance in mind, the shipowner and operator can study his problem and decide the question of type of power on the basis of all-round economics.

In order to obtain the most practical picture of current marine diesel activity in the United States, there is illustrated and described in the following pages twelve comparatively recent installations in American merchant craft. Diesel engines produced by twelve American diesel engine builders are illustrated and described. This is the seventh consecutive annual marine diesel engine review using a page for each installation. It will be noticed that there is only one vessel of sea-going type illustrated. There have been no other installations of this type during the past year.

The two largest engines illustrated are one of 2800 horsepower in a tanker and one of 2130 horsepower in a ferry. The smallest installations featured is an engine of 100 horsepower. In thus giving the principal characteristics of twelve different diesel engines with a brief description and illustration of the vessels in which they are installed, the owner, operator, naval architect and marine engineer will have at hand in condensed form accurate data on a wide variety of current marine diesel engines, and also actual installations.

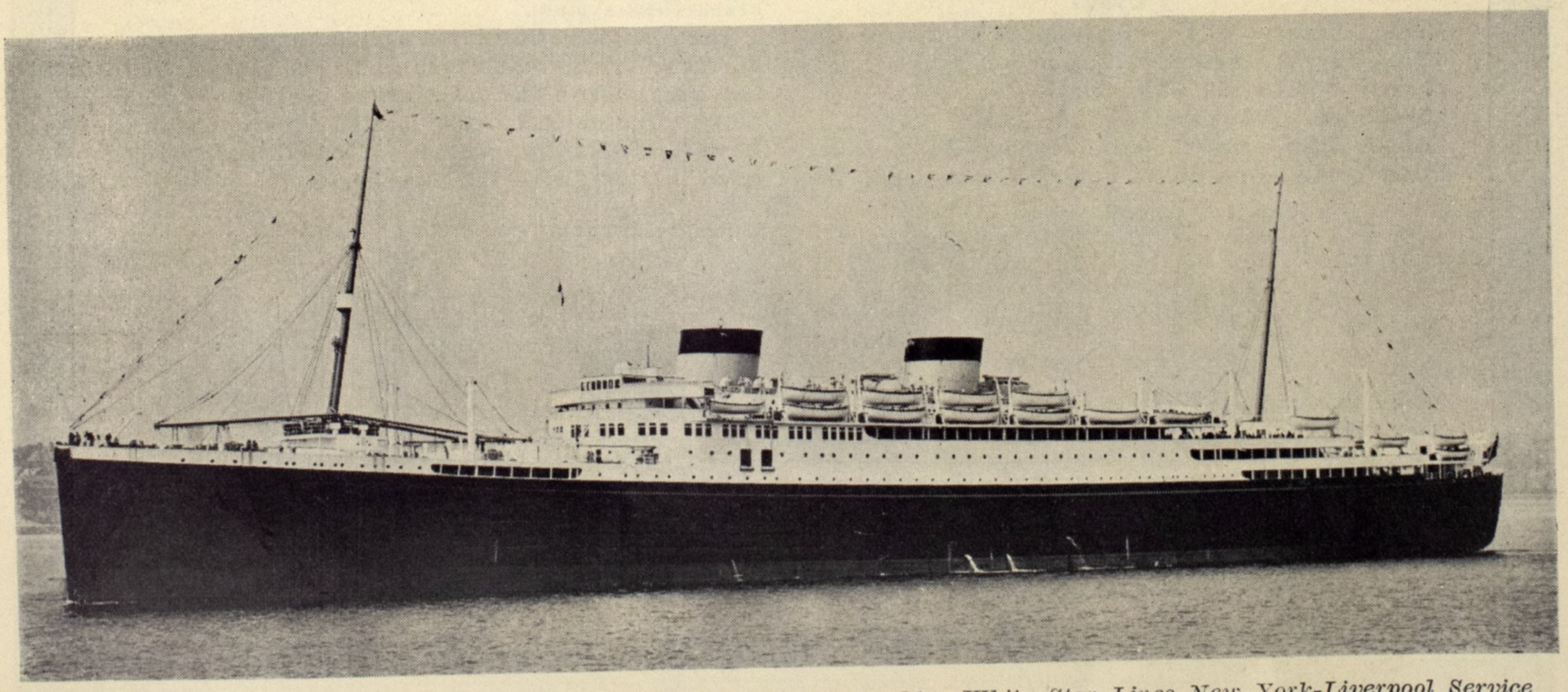
This review shows the present status of the American marine diesel engine as far as commercial craft are concerned, but it in no way indicates the limits of future possibilities for its use in American vessels of all types.

It might be well to summarize here some of the conclusions of the recent report of the shipping board on the diesel conversion program. Of the first group of twelve vessels, eleven are now operating without serious difficulty or detention and at the expected reduced cost. It must be borne in mind that five of the twelve engines installed were not only the largest but also the first double-acting engines installed in vessels in this country.

The vessels of the first group and the three diesel electric drive vessels, the report states, have operated at better speeds and lower costs than the steam vessels they replaced on the trade routes served. Of the eight vessels in the second group, six operate at increased speeds expected, without any serious troubles or detentions, and with operating expense less than those for the steam vessels they replaced.

As a result of this program the diesel engine industry has acquired the necessary experience for the construction of completely dependable engines. In the time which has elapsed since the completion of the shipping board's diesel program very definite progress has been made in improvement of design and in the reduction of weight and cost. Many refinements have been incorporated so that the present day American marine diesel engine is much in advance, not only of the engines in the shipping board vessels, but also of foreign engines of the same period.

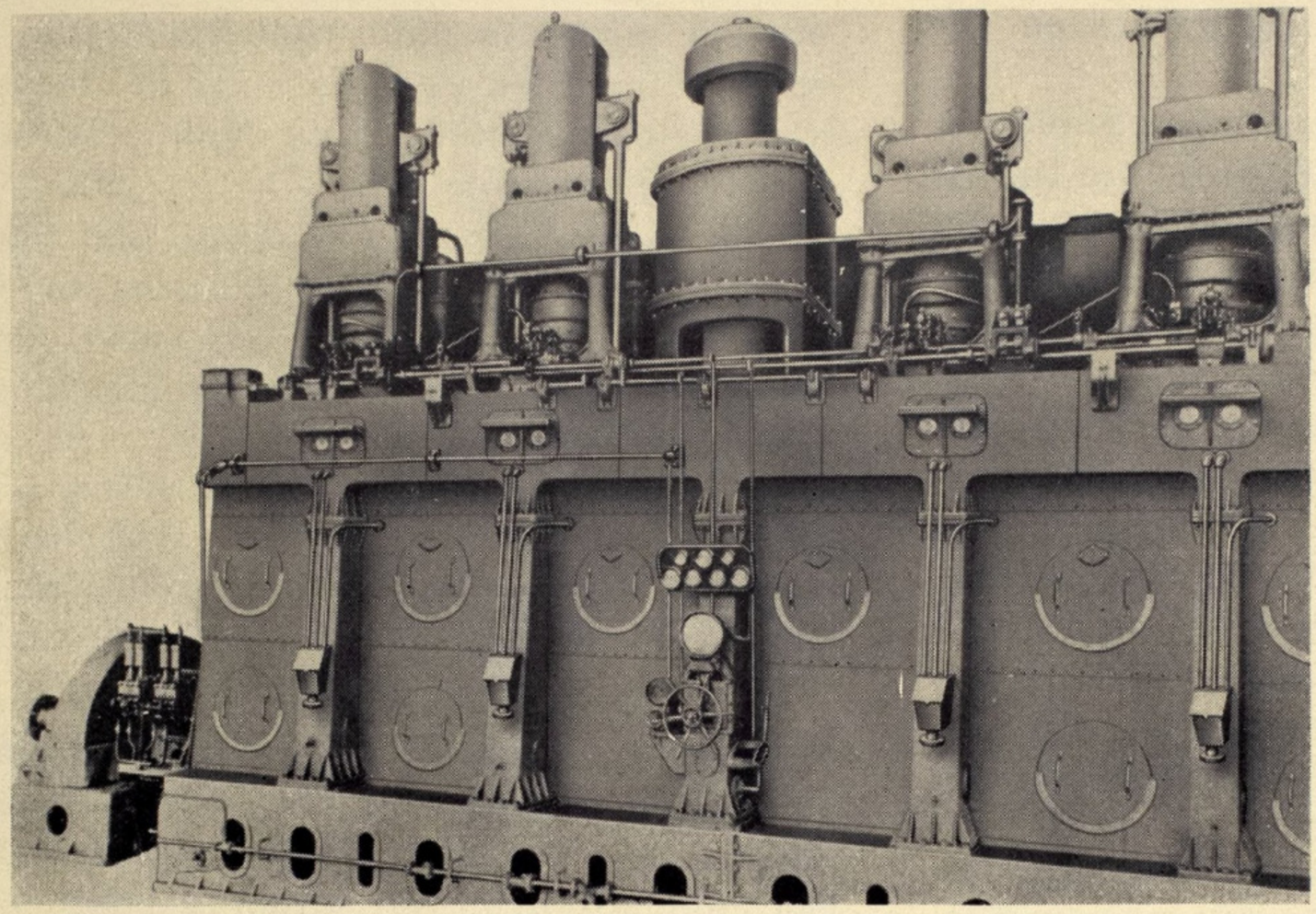
With a revival of ocean shipping as business conditions improve, it may be confidently expected that there will be a demand for this economical type of power.



Twin Screw M. S. Georgic, 27,759 Gross tons—Largest British Motorship—White Star Lines New York-Liverpool Service

Diesel Direct Drive in Tanker Mercury Sun

One Engine—2800 B.H.P.



DESCRIPTION

This engine is of the vertical, two-cycle, four-cylinder, long stroke, slow speed, heavy duty, crosshead, direct reversing, opposed piston type. Medium compression with solid or mechanical injection of fuel atomization is used. This vessel is quite similar to the tankers BRILLIANT and DAYLIGHT, built by the same company and fitted with the same power. The propelling power in a single screw is sufficient to give this 14,791 deadweight-ton tanker a speed of 11 knots in service.

Engine

Name of Engine—Sun-Doxford; **Year**—1931
Builder—Sun Shipbuilding & Dry Dock Co.
Cycle—2; **No. of Cylinders**—4; **I.H.P.**—3256
B.H.P.—2800; **Action**—Single; **Injection**—Solid
Scavenging—Attach.; **Piston Coolg.**—Fresh Water
Bore—23⅝ in.; **Stroke**—91⅜ in.; **R.P.M.**—80
Piston Speed—609 ft. p.m.; **Press. Indicated**—101
Pressure Brake—87; **B.H.P. per Cyl.**—700
I.H.P. per Cylinder—814; **Mechanical Eff.**—86%
Stroke to Bore—3.87; **Wkg. Str. per Rev.**—Four
Lgth. O.A.—56 ft. 2 in.; **Hght. O.A.**—32 ft. 1 in.
Width Overall—13 ft. 5 in.; **Reversing**—Direct
Weight—780,000 lbs.; **Per B.H.P.**—278 pounds
Air Compressors—Two, one electric, one steam

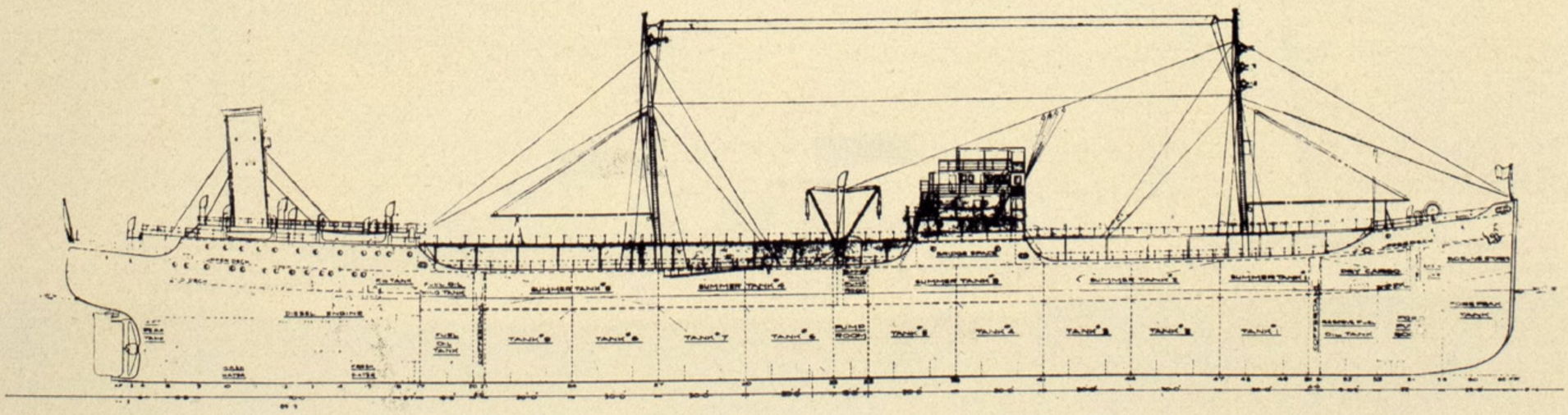
Vessel

Name—MERCURY SUN; **Bldr.**—Sun S. B. & D. D. Co.
Type—Single screw ocean going oil tanker
Owner—Motortank Ship Corp.
Completed—Delivered Dec. 17, 1931
Length B.P.—480 ft. 6 in.; **Beam**—65 ft. 9 in.
Main Drive—One diesel engine direct connected
Depth—37 feet; **draft**—29 feet.
Displ.—20,437 tons; **Deadweight**—14,791 tons
Speed in Knots—11; **No. of Propellers**—One
Fuel Capacity—Barrels, 4580; 650 tons
Fuel Consumption—Lb. per b.h.p. per hr.—0.37
Lb. i.h.p. per hr.—0.32; tons a day—12.3
Radius Without Refueling—13,000 naut. miles
Generators—Two, 75 k.w. each, at 325 r.p.m., General Electric, driven by Cooper-Bessemer three-cylinder, 120 horsepower diesel engine

Remarks

This vessel is generally similar to the tankers BRILLIANT and DAYLIGHT, built by the same shipyard for the Standard Transportation Co. She is of two-deck type with straight stem and cruiser stern and is built on the Isherwood longitudinal bracketless system.

There are ten main tanks divided longitudinal by an oiltight center line bulkhead. On each side in the wings above the main tanks are five summer tanks. The pump room is located a short distance forward of midship. There is also a forward pump room located aft of the forepeak tank.



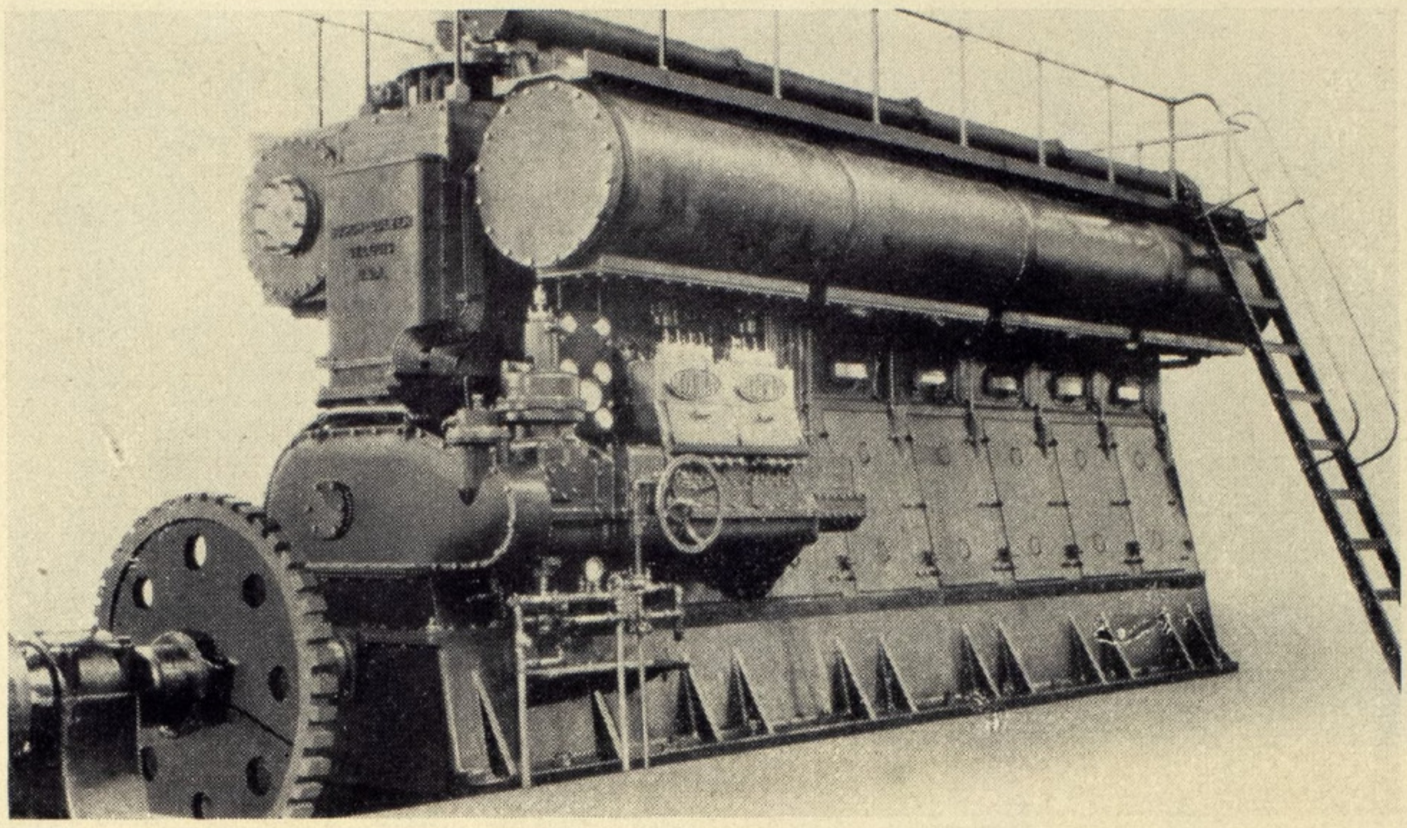
Inboard profile Tanker Brilliant—Similar ex cept in minor details to the Mercury Sun

Diesel Direct Drive in Ferry Chippewa

One Engine— 2130 B.H.P.

DESCRIPTION

This engine is a direct reversible, eight-cylinder, mechanical injection two-cycle, trunk piston, improved type with considerable reduction in weight and cost over earlier designs. Unit bearing pressures are reduced by about 40 per cent. An annular open chamber in the lower part of cylinder jacket makes the piston visible permitting a close check of engine operation and lubrication.



Engine

Name of Engine—Busch-Sulzer; **Year**—1932
Builder—Busch Sulzer Bros. Diesel Engine Co.
Cycle—2; **No. of Cylinders** 8; **I.H.P.**—2540
B.H.P.—2130; **Action**—Single; **Injection**—Solid
Piston Coolg.—Oil; **Scaveng.**—Motor drive blower
Bore—19½ in.; **Stroke**—27 in.; **R.P.M.**—210
Piston Speed—945 feet per minute
Pressure Indicated—74.5; **Pressure Brake**—62.4
B.H.P. per Cyl.—266.7; **I.H.P. per Cyl.**—317.5
Mechanical Eff.—84%; **Stroke to Bore**—1.384
Working Strokes per Revolution—8
Length O.A.—32 ft. 4½ in.; **Width** 6 ft. 6¾ in.
Height O.A.—11 ft. 1½ in. above c.l. of shaft
Weight—One engine, 205,000 pounds
Weight—Per b.h.p.—96 lbs.; Per i.h.p.—80.5 lbs.
Reversing—Direct reversing
Air compressor—Motor driven, for starting air

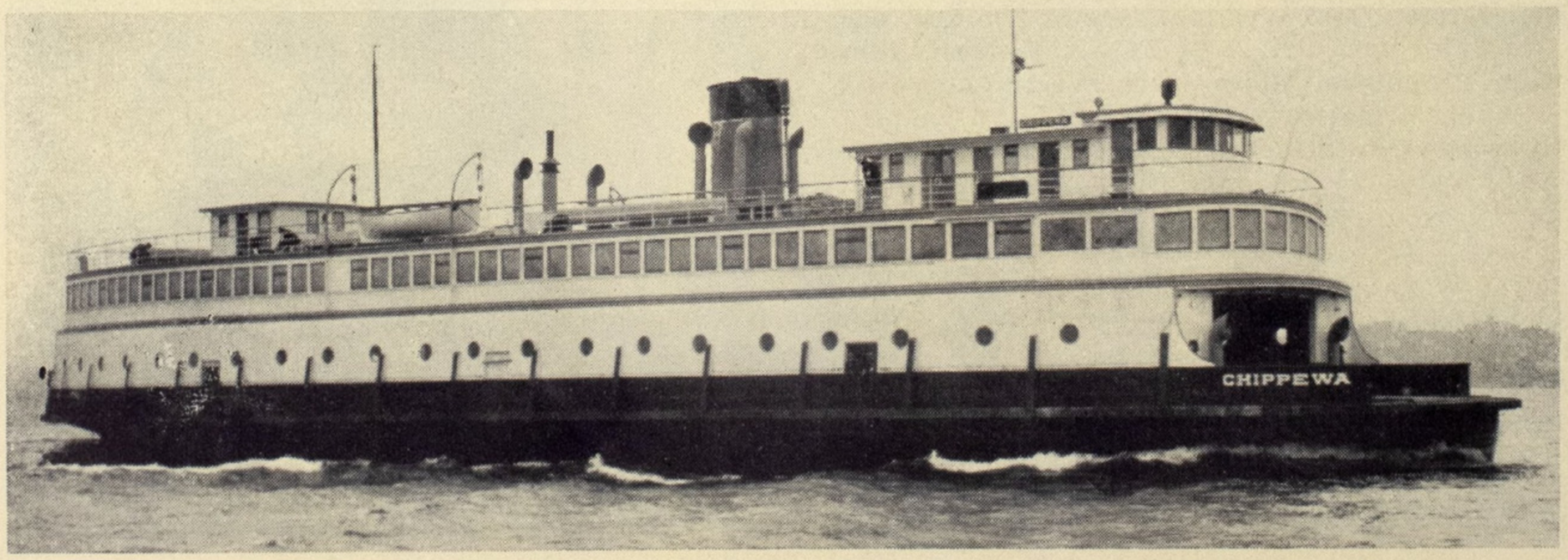
Vessel

Name—CHIPPEWA; **Type**—Passenger ferry
Owner—Puget Sound Navigation Co.
Builder—Converted by Lake Washington Shipyards
Completed—April 20, 1932
Drive—Single screw diesel direct connected
Length B.P.—191 feet; **Beam**—52 ft. 5 inches
Draft—12 feet; **Speed**—In knots, 16¾
No. of Propellers—One; **Fuel Capacity**—360 bbls.
Fuel Consumption—Lb. per b.h.p. per hr.—0.38
Generator—One General Electric generator, 250 k.w. at 360 r.p.m., four-cycle diesel drive

Remarks

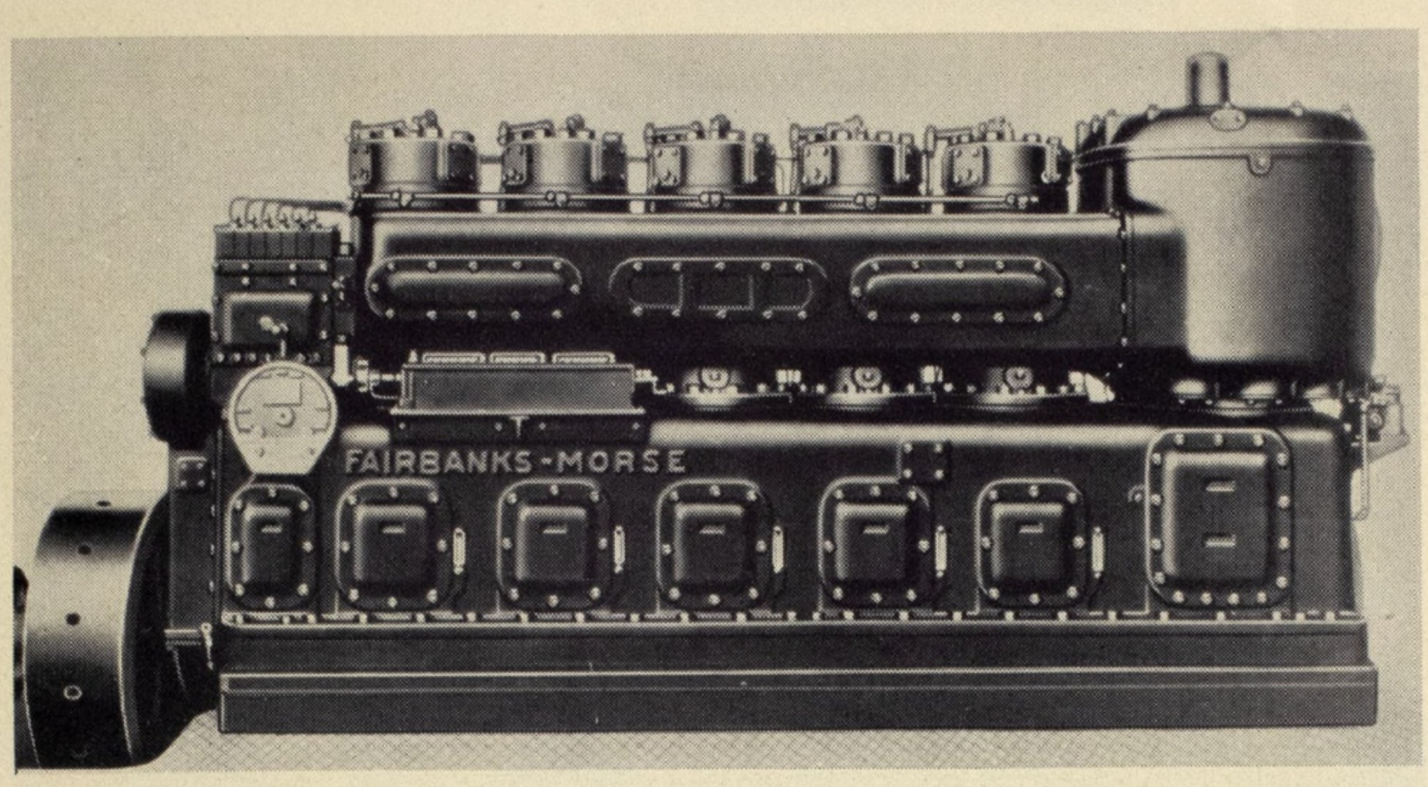
The CHIPPEWA owned and operated by the Puget Sound Navigation Co., Seattle, Wash., was converted from steam to diesel drive early this year, and returned in April to her regular run between Seattle and Bremerton, Wash., a distance of 16 miles. The former steam power plant, a 1400 shaft horsepower triple expansion engine, was replaced by the 2130 shaft horsepower, Busch-Sulzer diesel engine illustrated.

Certain hull changes were also made completely altering the exterior appearance, and the interior was converted into a luxurious type of passenger and automobile ferry. It is said that the CHIPPEWA in her present condition is the largest, fastest highest powered, finest ferry in United States.



Diesel Electric Drive in Walter Wyman

Two Engines—Each 325 B.H.P.



DESCRIPTION

Two diesel engines of the type illustrated and described here, each of 325 brake horsepower, direct connected through a flexible coupling to a 205 k.w. direct current generator, supply the power for one main propulsion motor of double armature type, each armature developing 250 horsepower. The propulsion motor drives screw

Engine

Name of Engine—Fairbanks-Morse; **Year**—1932
Builder—Fairbanks, Morse & Co.; **Cycle**—Two
No. of Cyls.—5; **B.H.P.**—325; **Action**—Single
Injection—Solid; **Scavaging**—Pump
Piston Coolg.—Oil; **Bore**—12 in.; **Stroke**—15 in.
R.P.M.—300; **Piston Speed**—750 feet per minute
B.H.P. per Cyl.—65; **Stroke to Bore**—1.25
Wkg. Strokes per Rev.—5; **Hgth. O.A.**—7 ft. 10 in.
Length O.A.—17 ft. 1 in.; **Width**—6 ft. 4¼ in.
Weight—53,015 lbs.; **Lbs. per B.H.P.**—163
Reversing—None; **Air Compressor**—50 cu. ft.

Vessel

Name—Walter Wyman; **Type**—Inspection vessel
Owner—United States Public Health Service
Builder—Spedden Shipbuilding Co.
Completed—February, 1932
Main Drive—Single screw, diesel electric
Length O.A.—100 feet; **Beam mld.**—23 ft. 2 in.
Depth—14 ft. 2½ in.; **Draft**—11 ft. 1½ in.
Displacement—270 tons; **Gross Tonnage**—193
Speed—In knots, 11.7; **No. of Propellers**—One
Fuel Capacity—In bunkers, 72 bbls., 11 tons
Fuel Consumption—Lb. per B.H.P. per hr.—0.42
Radius Without Refueling—1100 miles
Generators—Two Westinghouse of 205 k.w. each, at 300 r.p.m., driven by Fairbanks-Morse diesel
Main Propulsion Motor—One Westinghouse d.c., double armature, 500 B.H.P. at 175 r.p.m.
Exciters—One attached to each main generator, 125 volts, 25 k.w., Westinghouse

Remarks

The Walter Wyman is one of the most powerful tugs in the quarantine division of the United States Public Health service. This vessel is attached to the United States Quarantine Station at Rosebank, Staten Island, N. Y., and is used as an inspection and boarding vessel.

The hull is built of wrought iron plates with wrought iron rivets up to the water line. Usual mild steel is used for construction above the water.

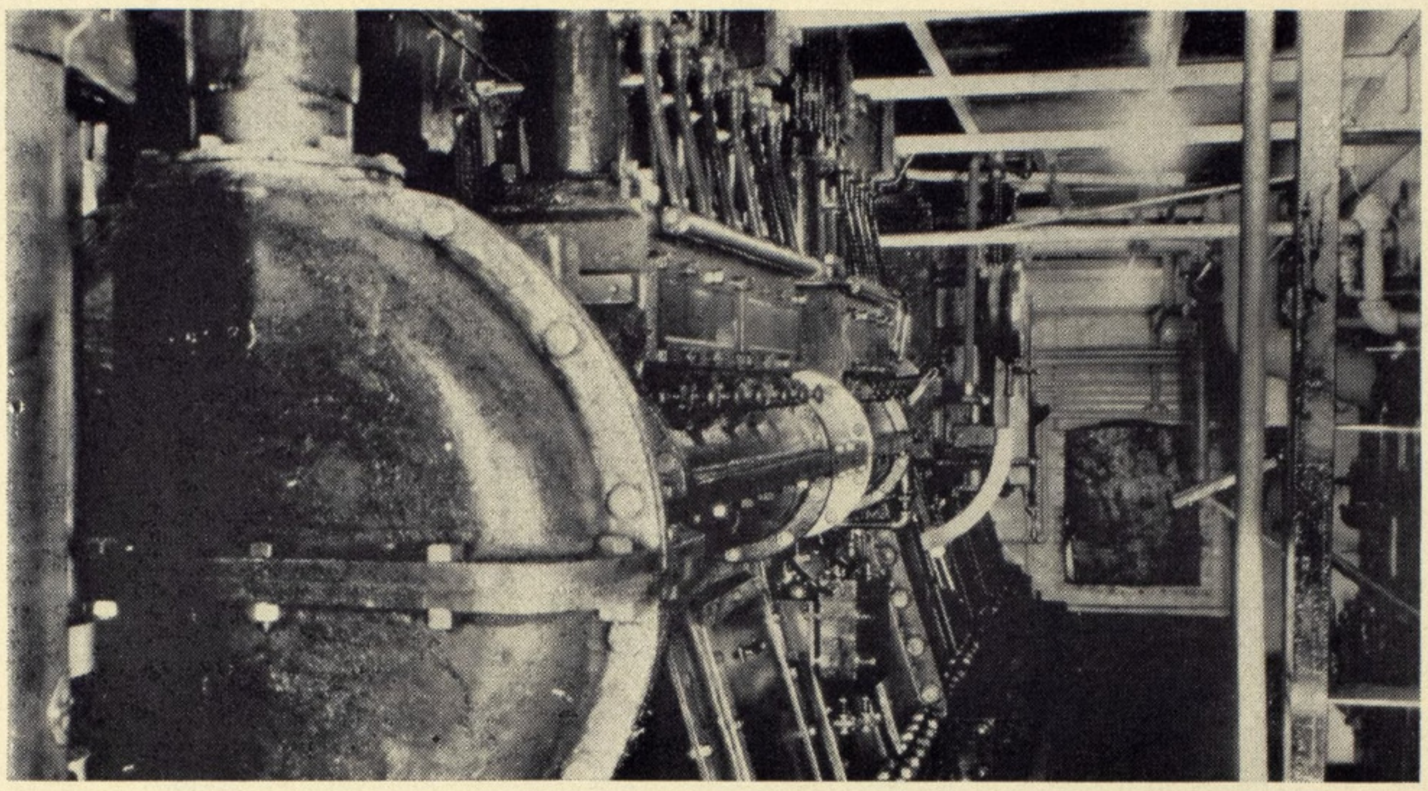
Reliability and ease of maneuvering are assured from the type of main drive installed. As described above, there are two diesel engine driven generator sets, each consisting of one of the 325 brake horsepower engines described and illustrated on this page, connected through flexible coupling with the generator. Each generator develops 820 amperes at 250 volts full load, and 300 revolutions per minute.

The electric current generated is delivered to one double armature, direct current, propulsion motor, direct connected to the propeller. This electric motor supplies 500 horsepower to a three-blade bronze propeller, 96 inches in pitch and 96 inches in diameter, at 175 revolutions per minute. It can be controlled either from the pilot house or from the engine room by a switch.

On the trial trip full power was absorbed with the propulsion motor turning at 180 revolutions.

Diesel Direct Drive in Supply Ship North Star

One Engine—1525 B.H.P.



DESCRIPTION

The propelling power in this vessel is one four cycle, trunk piston diesel engine, direct connected to the propeller, developing 1525 b.h.p. at 220 r.p.m. The accompanying illustration shows the engine controls and maneuvering platform. On each side of the main engine is a 110 horsepower diesel engine generating set. This vessel is of wooden construction

Engine

Name—McIntosh & Seymour; **Year**—1932
Builder—McIntosh & Seymour Corp.; **Cycle**—4
Cyls.—10; B.H.P.—1525; **Action**—Single
I.H.P.—1880; **Injection**—Mechanical (Solid)
Piston Cooling—Oil cooling; **Bore**—20 inches
Stroke—24 in.; **R.P.M.**—220; **Speed**—880f.p.m.
B.H.P. Per Cyl.—152.5; **I.H.P. ped Cyl.**—188
Mech. Eff.—81%; **Wkg. Strokes per Rev.**—5
Length—39′ 6″; **Height**—11′ 7″ **Width**—6′ 1″
Weight—243,000 lbs.; **Reversing**—Direct
Air Compressor—Motor driven, for starting only

Vessel

Name—North Star; **Type**—School Supply Ship
Owner—U. S. Interior Dept., Bur. of Education
Builder—Berg Shipbuilding Co.
Completed—Sailed from Seattle, May 28, '32
Main Drive—Diesel direct, single screw
Length O.A.—225 ft.; **Length B.P.**—209 ft. 3 in.
Beam—41 ft.; **Depth**—21 ft. 6 in.; **Draft**—16 ft.
Speed—In knots, 12¾; **No. of Propellers**—One
Fuel Capacity—1800 barrels
Fuel Consumption—Lb. per b.h.p. per hr.—0.42
Radius Without Refueling—36 days

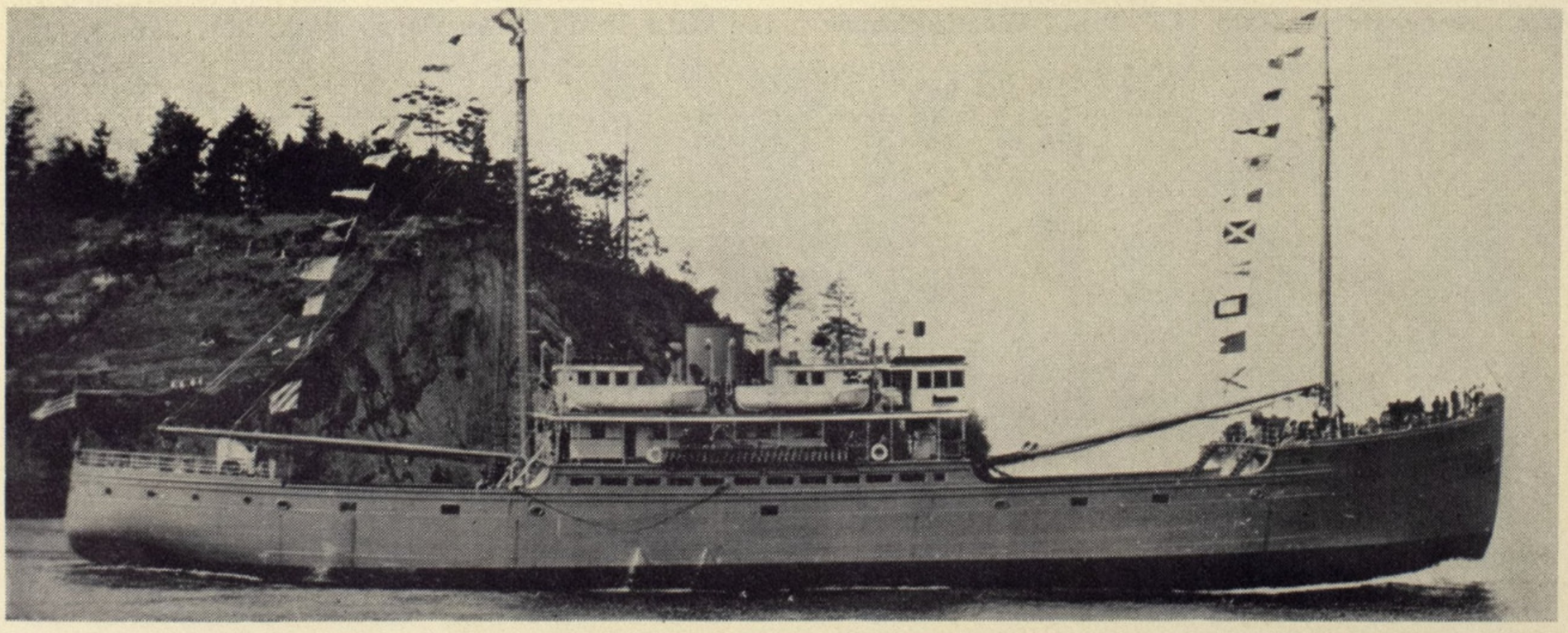
Remarks

The North Star is of substantial wooden construction, with cruiser stern rounded bow, cutaway forefoot and hull lines of modified V section. The design was worked out by W. C. Nickum, a Seattle naval architect, and trial results in fairly heavy weather indicated the vessel is easy-riding and quick in maneuvering. On trial runs in Puget Sound, the North Star averaged 12.89 knots for four runs and thus exceeded her guarantee by neaerly one knot.

Two genereating sets are each driven by a four-cylinder, 110 horsepower Atlas diesel engine. The pumping equipment was supplied by the Delaval Steam Turbine Co.

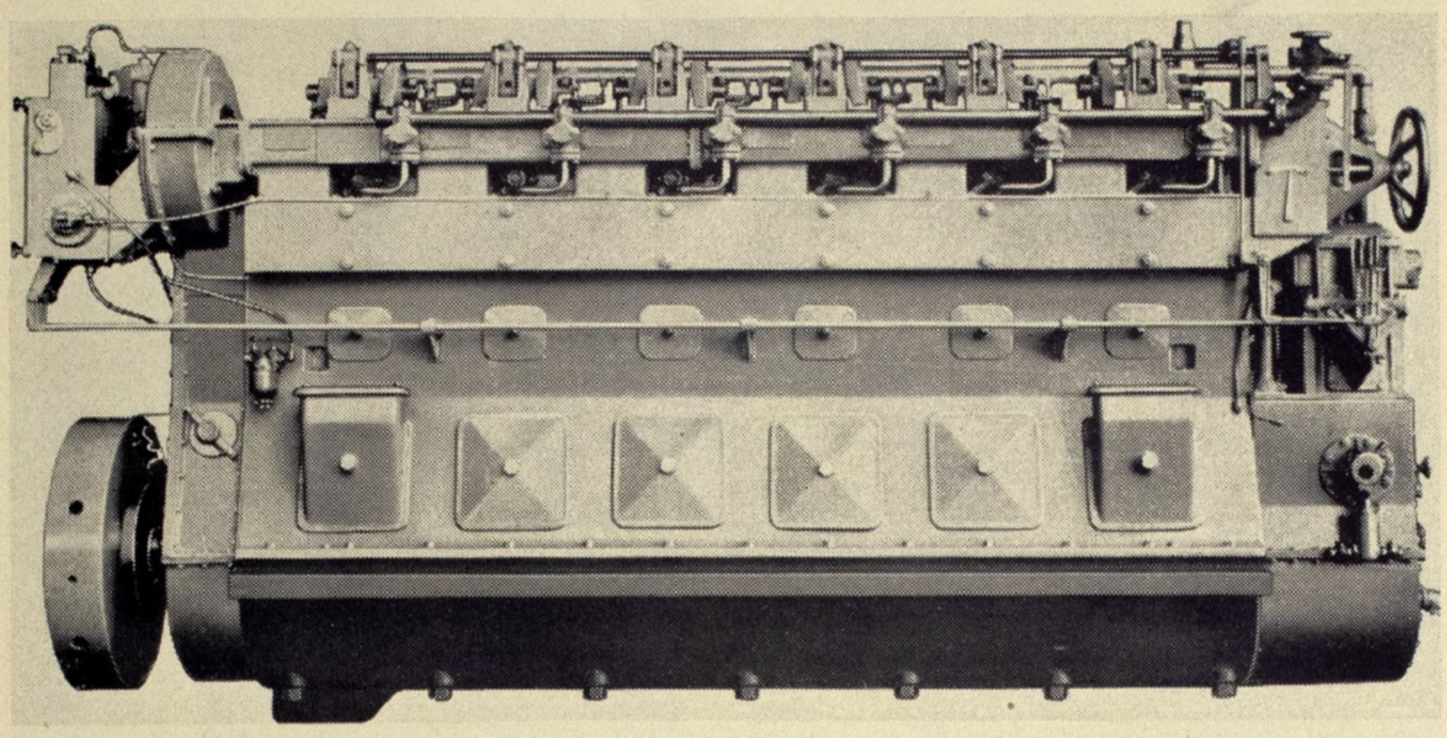
The electric-hydraulic steering gear and all other deck machinery, which is fitted with electric drive, was supplied by Allan Cunningham.

The main engine is direct connected to a three-bladed bronze propeller, 9 feet 8 inches in diameter and 9 feet 3 inches in pitch.



Diesel Direct Drive in Patrol Boat Thetis

Two Engines—Each 670 B.H.P.



DESCRIPTION

Each of the seven vessels of this type for the coast guard is powered with two diesel engines of the type illustrated and described here. These engines are of six cylinder, four cycle, airless injection, direct reversible type, developing 670 b.h.p. at 450 r.p.m. Each engine is direct connected to a propeller. There are two 15 k.w. generator sets.

Engine

Name of Engine—Winton; **Year—1932**
Builder—Winton Engine Corp.; **Cycle**—Four
No. of Cylinders—6; **Brake Horsepower**—670
Action—Single; **Injection**—Solid (airless)
Piston Coolg.—No; **Bore**—14 in.; **Stroke**—16 in.
R.P.M.—450; **Piston Speed**—1200 feet per min.
Pressure Brake—80; **B.H.P. per Cyl.**—111 2/3
Stroke to Bore—1.14; **Wkg. Strokes per Rev.**—3
Length O.A.—19 ft. 4 in.; **Width O.A.**—5 ft. 11 3/8
Height—Base to top of engine—8 ft. 2⅛ in.
Weight—Each engine complete, 51,000 pounds.
Weight—Pounds per b.h.p. one unit, 76.1
Reversing—Direct; **Com.**—Two (Independent)

Vessel

Name—THETIS; One of seven of this class;
Type—Patrol Boat, United States Coast Guard
Builder—Bath Iron Works Corp.
Completed—Entire fleet, Nov. 1931 to April '32
Length O.A.—165 feet; **Beam**—Mld. 24 ft. 1 in.
Depth—Mld., 13 ft. 2½ in.; **Draft**—Mean 7′ 6″
Speed—In service, 16½ knots.
Fuel Consump.—Lb. per b.h.p. per hour—0.45
Aux. Generators—Two 15 k.w. Westinghouse direct connected to Winton diesel engines; one Universal 5 k.w. compressor-generator.

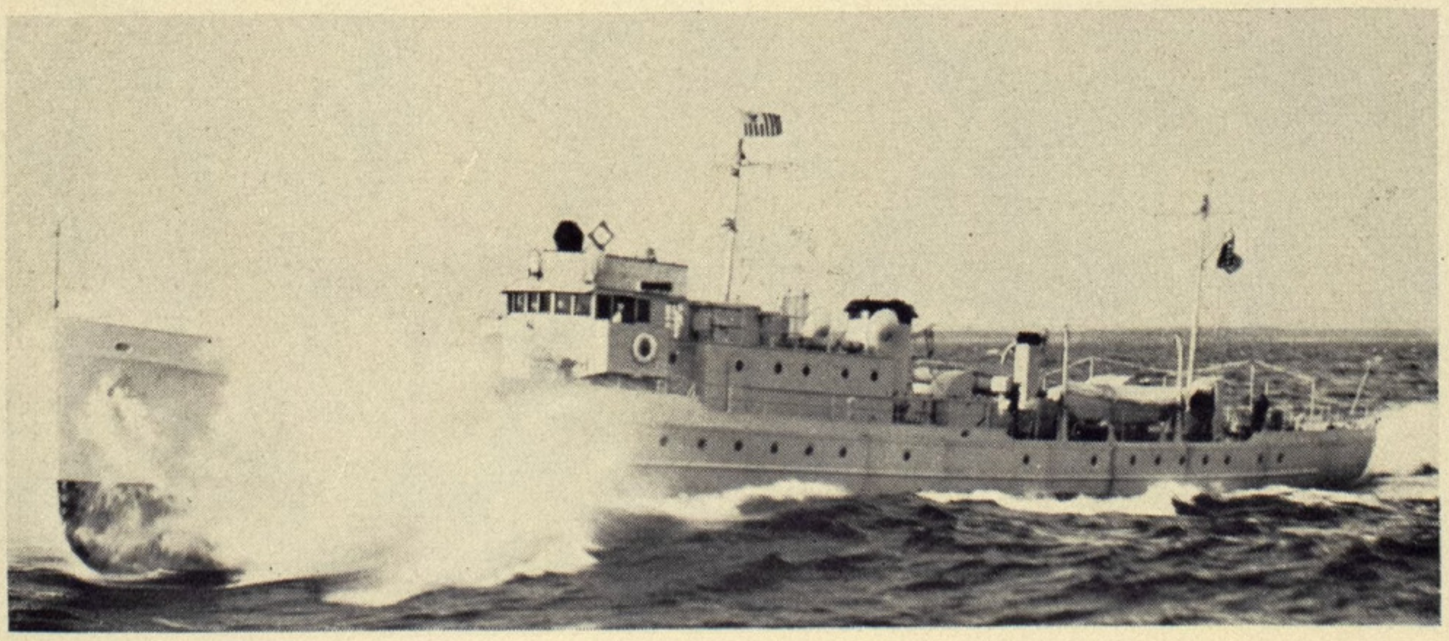
Remarks

The THETIS and class are high speed, twin screw, off-shore patrol boats and were designed especially for enforcing laws against smuggling. They are excellent sea boats and, equipped with twin rudders, maneuver readily and turn quickly. Sea trials demonstrated their seaworthiness and all round smooth performance. In addition to the THETIS, the names are AURORA, CALYPSO, DAPHANE, MERMES, ICARIUS and PERSEUS. The contract cost of each vessel was $195,000.

The displacement loaded is 332 tons. With a bunker fuel capacity of 26.7 tons the cruising radius is about 2500 miles at a service speed of 16½ knots.

Comfortable quarters are provided for the officers and crew. In their entire layout, construction and performance, these new patrol boats are the most advanced vessels of their type. Special care was used in the arrangement of the machinery to give maximum accessibility and convenience in operation.

Contract for these seven vessels was awarded to the Bath Iron Works Corp., Bath, Me., Jan. 9, '31.

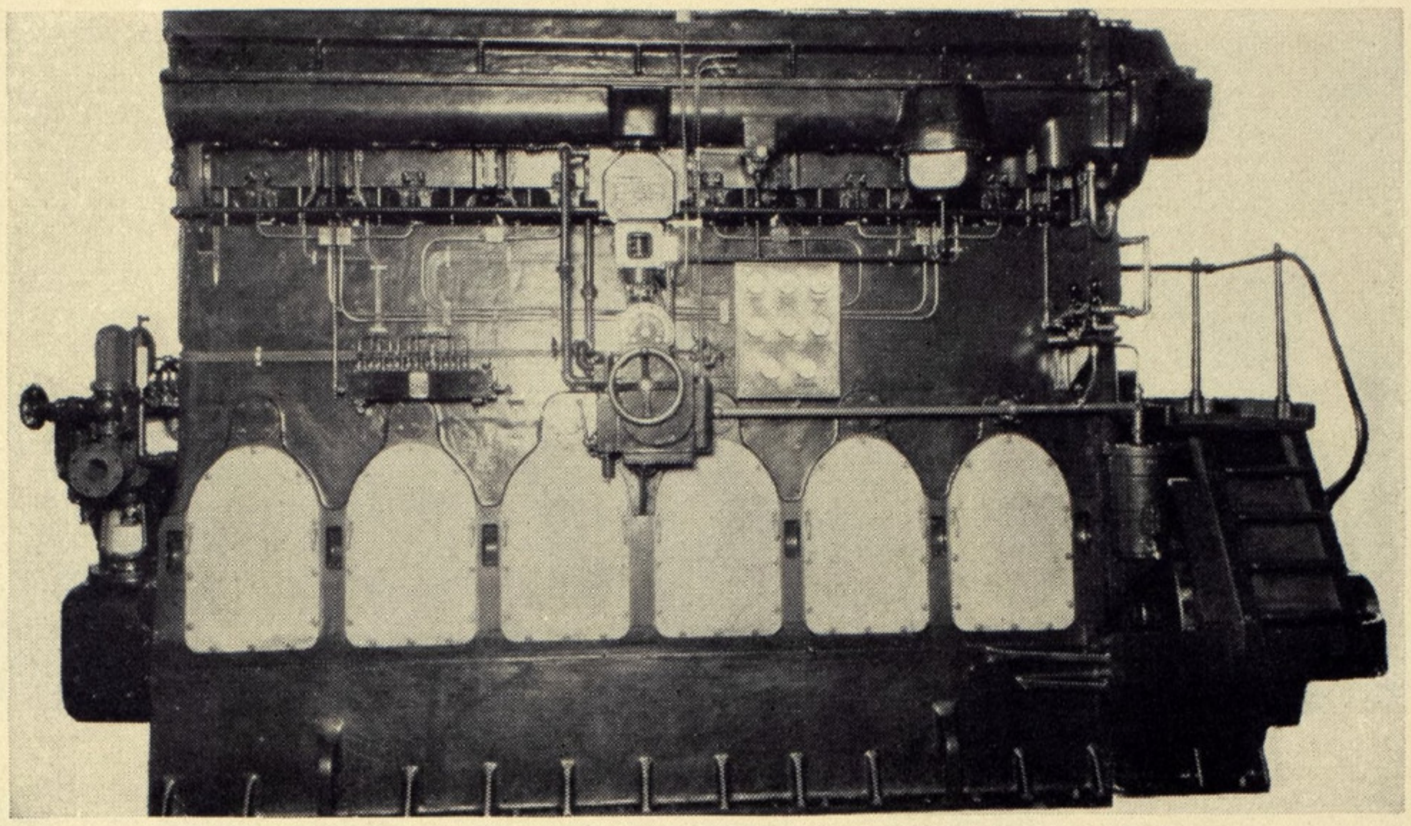


Diesel Direct Drive in Freighter Teapa

Two Engines—Each 750 B.H.P.

DESCRIPTION

Propulsive power is supplied by two of these engines each direct connected to a propeller. The engines are trunk piston type with overhead camshaft, enclosed, box cylinder casting, individual liners, shell bearings, fuel pump and distributor. Cylinder heads of Price design are fitted with opposed spray nozzles. The engines are single acting, four-cycle, six cylinders and have solid injection.



Engine

Name of Engine—Ingersoll-Rand; **Year**—1931
Builder—Ingersoll-Rand Co.; **Cycle**—4
No. of Cylinders—6; **B.H.P.**—750
Action—Single acting; **Injection**—Solid direct
Bore—16 in.; **Stroke**—24 inches; **R.P.M.**—270
Piston Speed—1080 feet per minute
Pressure Brake—75 lbs.; **B.H.P. per Cyl.**—125
Reversing—Direct; Air Comp.—Motor driven

Vessel

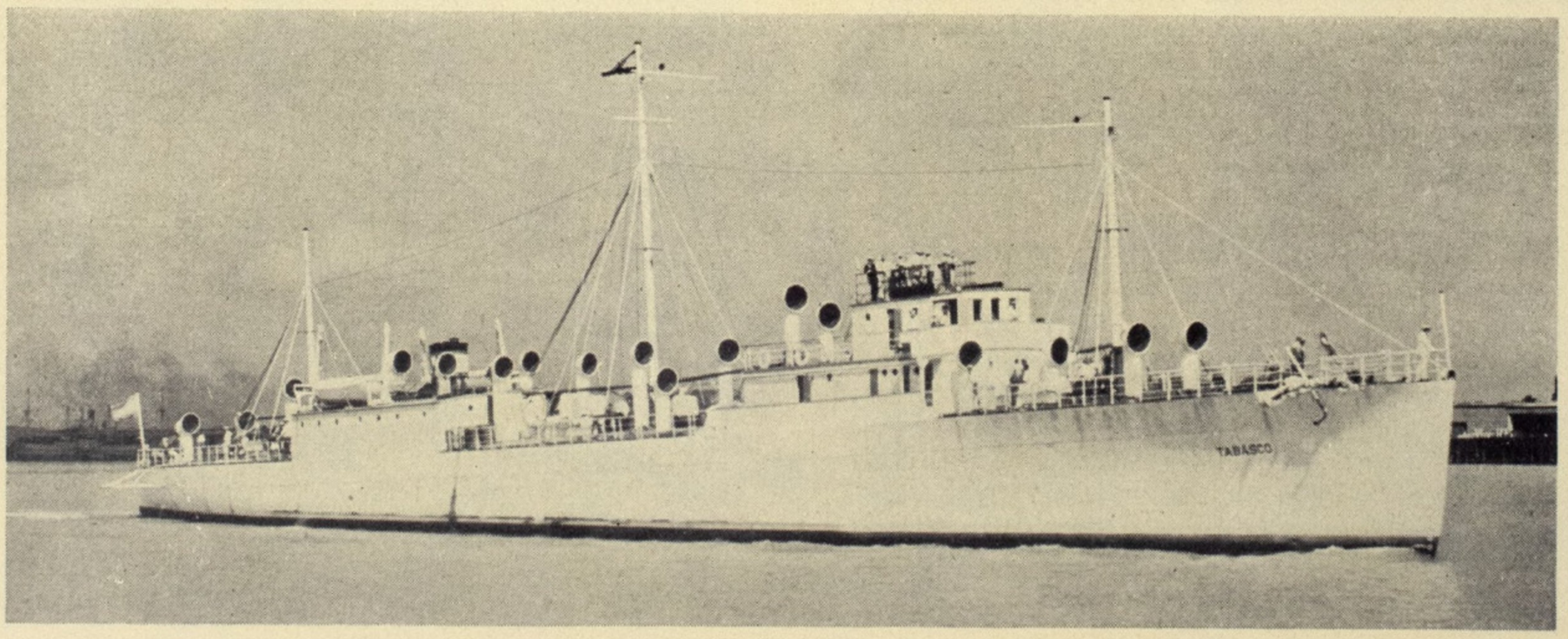
Name—TEAPA; also sister vessel TABASCO
Type—Destroyer converted to fruit freighter
Owner—Standard Fruit and Steamship Co.
Builder—Converted by Todd Engineering D. D. & Repair Co.
Completed—Fall of 1931
Main Drive—Twin screw direct
Length B.P.—310 ft.; **Beam**—30 ft., 11.5 in.
Depth—20 ft. 7¾ in.; **Draft**—9 feet 6 inches
Speed—14.5 knots; **No. of Propellers**—Two
Radius Without Refueling—12000 miles

Generator—Westinghouse, 35 k.w. @ 450 r.p.m. driven by Ingersoll-Rand diesel engine

Remarks

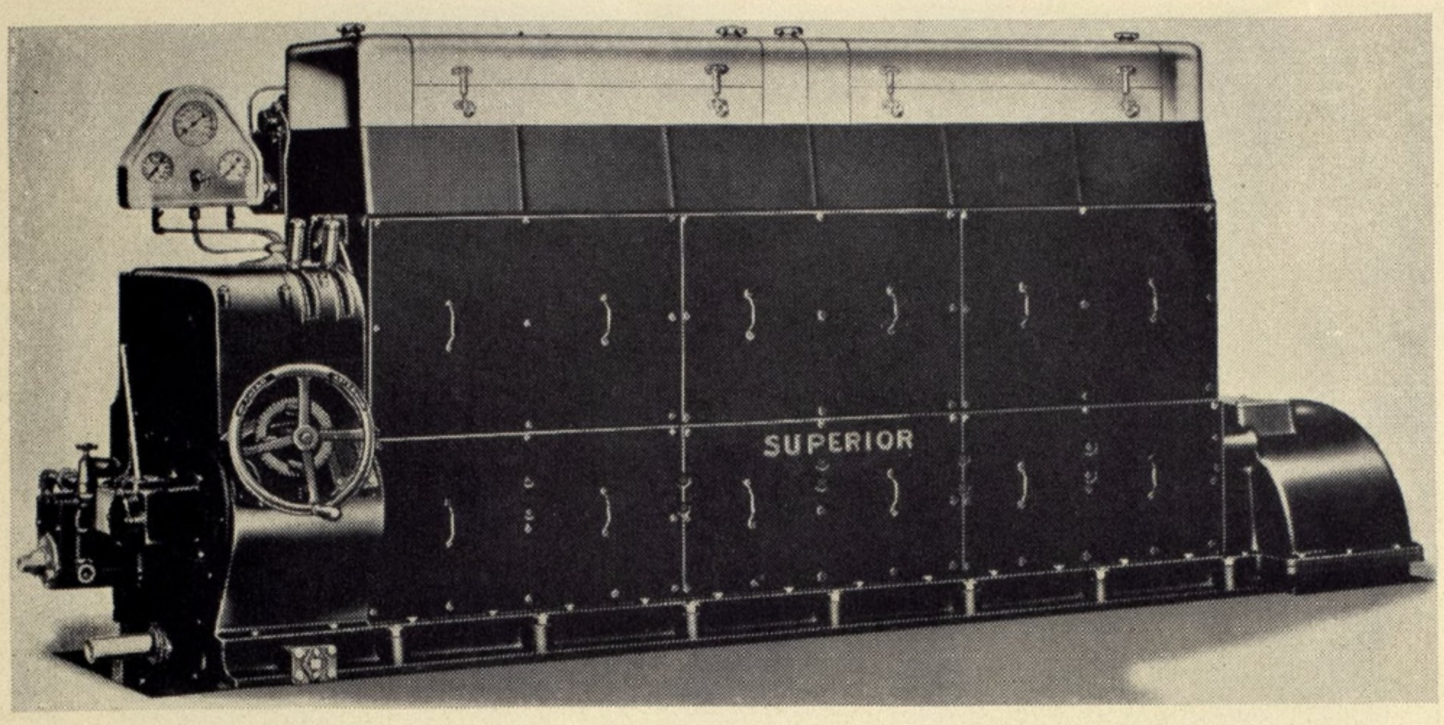
In converting these two navy destroyers by removing the original machinery and installing in each two diesel engines, each direct connected to a propeller, and by rearranging the hulls for carrying fruit, the owner has secured two fast and economical freight carriers. On first entry into service the TEAPA completed the trip from New Orleans to Honduras and thence to New York on 171 barrels of diesel fuel oil. On this voyage the TEAPA carried 20,000 bunches of bananas and averaged a speed of slightly better than 15.5 knots. The run from La Ceiba Honduras to New York was made in 103 hours and 26 minutes. The entire distance from New Orleans to New York, via La Ceiba, is approximately 2750 miles.

The vessel has been divided into four cargo holds with a capacity for 10,000 bunches of bananas. There are four hatches serving the four molds and four Novo cargo handling winches.



Diesel Geared Drive in Carrie S. Roderick

One Engine—260 B.H.P.



DESCRIPTION

The CARRIE S. RODERICK is a Gloucester fishing schooner. Propelling power is supplied by one four-cycle, six-cylinder 260 brake horsepower diesel engine shown here. The engine is connected with the propeller through a two to one reduction gear giving to the propeller 300 revolutions per minute.

Engine

Name of Engine—Superior diesel; **Year**—1932
Builder—Superior Engine Co.
Cycle—4; **No. of Cylinders**—6; **B.H.P.**—260
Action—Single; **Injection**—Mechanical (solid)
Piston Coolg.—Air; **Bore**—9 in.; **Stroke**—12 in.
R.P.M.—600; **Piston Speed**—1200 ft. per minute
Pressure Brake—74.9 pounds per sq. in. (mean)
B.H.P. per Cyl.—43.33; **Stroke to Bore**—13.3
Length O. A.—16 ft. 2 inches
Height O. A.—75 inches; **Width O. A.**—36½ in.
Weight—14,100 lbs.; **Lbs. per B.H.P.**—54.25 lbs.
Lbs. per B.H.P., all machinery—65.33 pounds
Reversing—Direct reversing
Air Compressor—Built in, for maneuvering

Vessel

Name—CARRIE S. RODERICK; **Type**—Fisherman
Owner—United Fisheries Corp., Gloucester
Builder—Story Shipyards, Essex, Mass.
Completed—Engine installation, May 1, 1932
Main Drive—Single screw, diesel geared drive
Length B. P.—81 ft. 5 in.; **Beam**—19 ft. 7 in.
Depth—9 feet 3 inches; **Draft**—10 feet
Displ.—74 gross tons; **Deadweight**—50 net tons
Speed—In knots, 9; **No. of Propellers**—One
Fuel Capacity—In bunkers, 600 barrels
Fuel Consumption—Lb. per b.h.p per h.—0.45
Radius Without Refueling—About 2500 miles
Generator—One 2½ k.w. Diehl Mfg. Co., belt-driven from aft end of main engine

Remarks

The CARRIE S. RODERICK is a Gloucester fishing schooner of solid wood construction, built at Story Shipyards, Essex, Mass., about ten years ago. She was originally powered with one 150 horsepower diesel engine. When the new engine described here was installed, early this year, an increased speed of 3 miles per hour was obtained. Since it was possible to use the same engine bed the change of installation was not expensive.

This vessel is of a heavy bulky type requiring considerable power for propulsion. She engages in sword fishing and also in dragging, and carries a crew of ten men.

The engine used in the RODERICK, of four-cycle, cold-starting, mechanical injection type, is of rugged construction and is designed for heavy duty and continuous service. Horsepower ratings are based on 75 pounds mean effective pressure which gives a considerable emergency overload capacity. Quick acceleration is possible with governor control at all speeds. The engine will operate on .4 to .45 pound per brake horsepower per hour at the rated load, depending upon operating conditions.

The entire engine including the flywheel is enclosed, dust-proof and oil-tight. Practically every part is readily accessible. Average compression pressure is 400 pounds per square inch while the firing pressure does not exceed 600 pounds at rated loads and speeds.

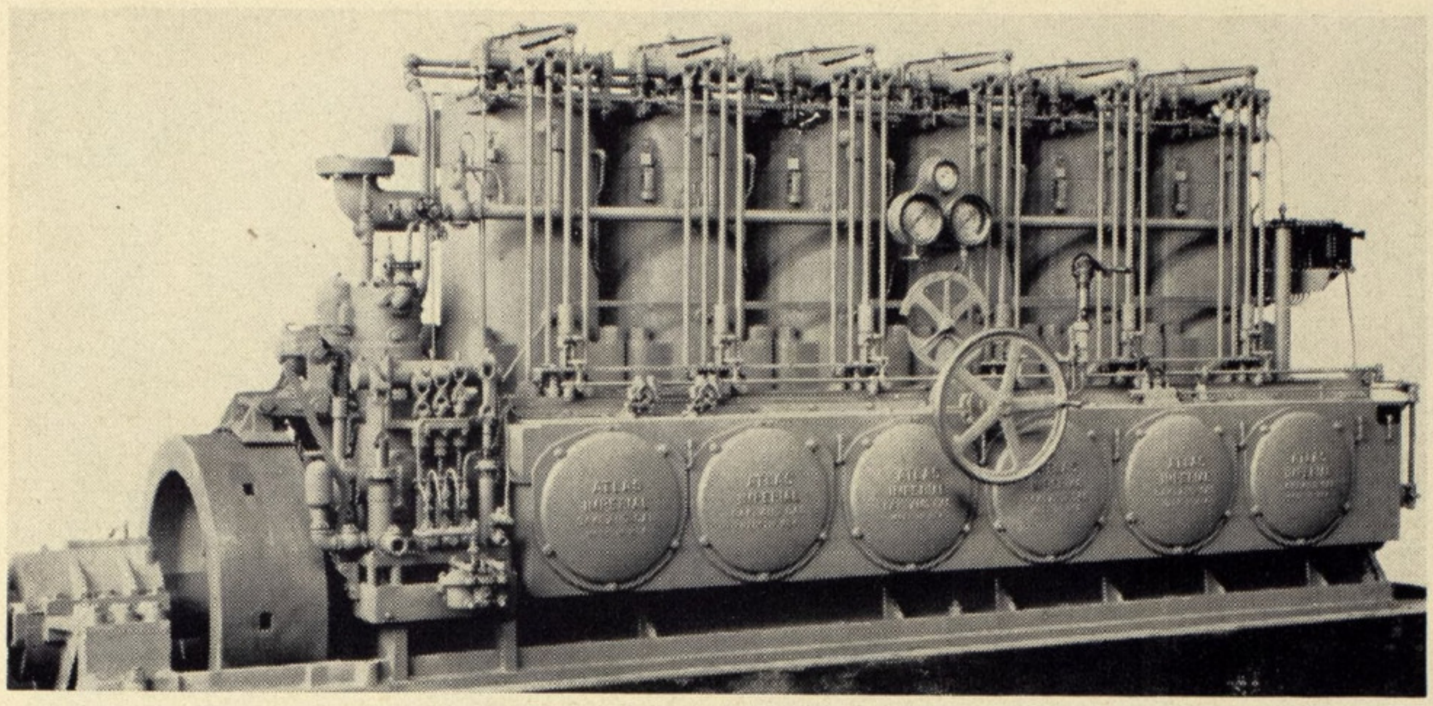
The lubricating system is of force feed type.

Diesel Direct Drive in Tug Jennie Barbour

Two Engines—Each 275 B.H.P.

DESCRIPTION

The propelling power in this steel hull, tunnel stern towboat is supplied by two diesel engines of this type each direct connected to a propeller. One engine runs in a right-hand direction and the other left hand. The engines are four-cycle, full diesel, and are direct reversible. Each engine is rated 275 h.p. at 275 r.p.m.



Engine

Name of Engine—Atlas Imperial; **Year**—1932
Builder—Atlas Imperial Diesel Engine Co.
Cycle—Four; **No. of Cylinders**—6; **B.H.P.**—275
Action—Single; **Injection**—Solid (Mechanical)
Piston Coolg.—Air; **Bore**—11½ in.; **Stroke**—15 in.
R.P.M.—275; **Piston Speed**—527 feet per min.
Pressure Brake—83 lbs.; **B.H.P. per Cyl.** 45.8
Stroke to Bore—1.3; **Wkg. Str. per Rev.**—3
Length O.A.—18 ft. 1⅞ in.; **Height**—8 ft. 3⅛ in.
Width O.A.—50 inches; **Weight**—38,130 lbs.
Reversing—Engine is direct reversing
Air Compressor—For maneuvering only

Vessel

Name—Jennie Barbour; **Type**—Tug, tunnel stern
Owner—Louisiana-Texas Waterways Corp.
Builder—Camulette Ship Building Co.
Main Drive—Twin screw diesel direct
Completed—August 20, 1932
Length B.P.—100 feet; **Beam molded**—24 feet
Depth—8 feet; **Draft**—4 feet, 8 inches
Displ.—72 net tons; **Deadweight**—130 tons
Speed—In knots, 12; **No. of Propellers**—Two
Fuel Capacity—Bunkers, 475 bbls.; or 60 tons
Fuel consumption—Lb. per B.H.P. per hr.—0.45
Radius Without Refueling—7000 nautical miles
Generator—One 10 k.w., at 1150 r.p.m. direct connected to Universal diesel engine

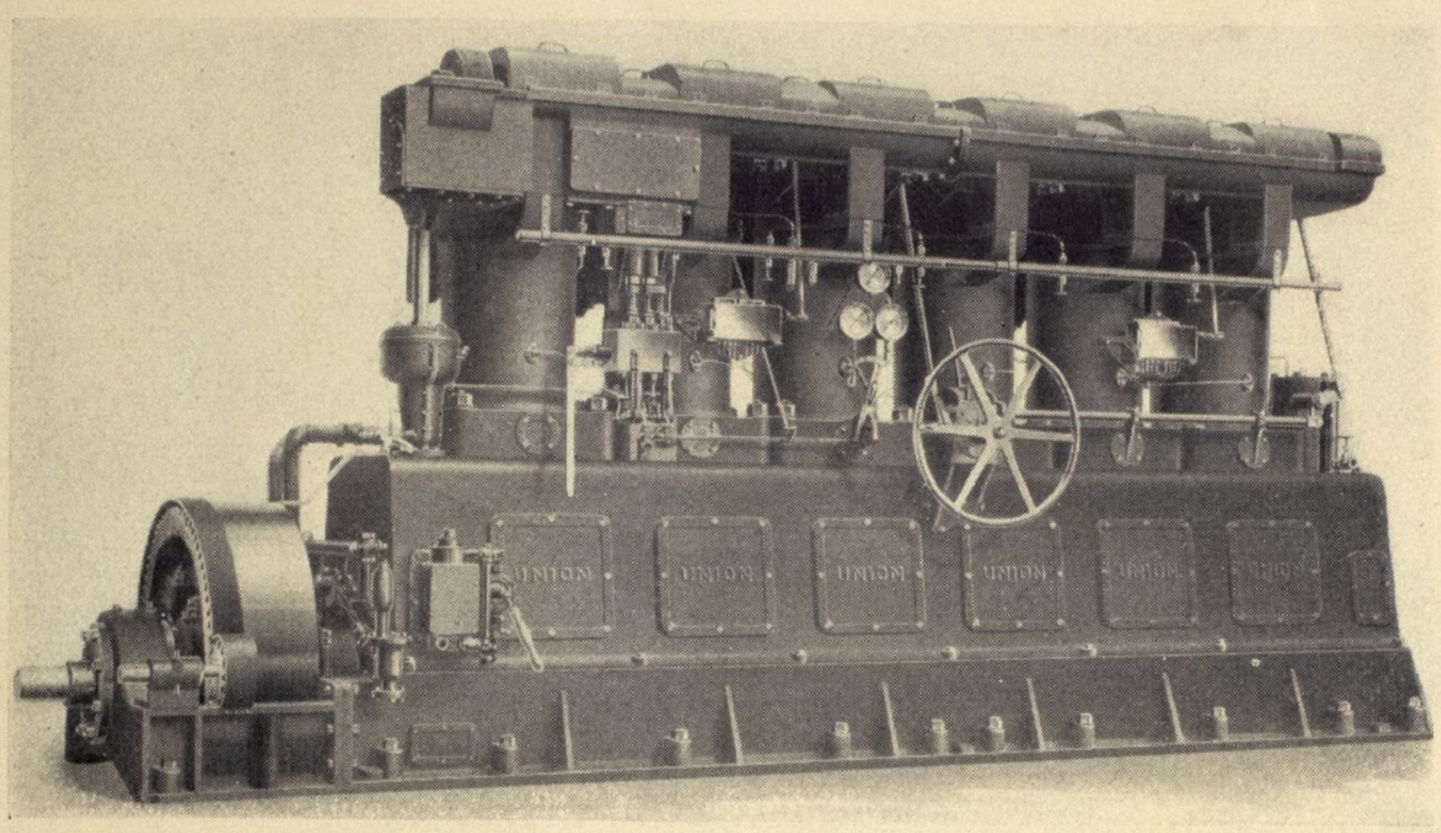
Remarks

As may be noted from the accompanying illustration, this is a fine able vessel with ample power. The hull is of steel construction and the propellers operate in tunnels in order to insure the unusually light draft of 4 feet 9 inches. The owner, the Louisiana-Texas Waterways Corp., New Orleans, is using this vessel for towing barges. She is a well designed vessel for this purpose, and represents a fine example of modern marine engineering for economical operation, ease of maneuvering and long radius of action without refueling.

The diesel engines installed are of individual cylinder type with removable liners. The fuel system is of the common rail, constant pressure type.

Diesel Direct Drive in Towboat Belle

One Engine—400 B.H.P.



DESCRIPTION

Propelling power in the log towing tug Belle is the diesel engine, described and illustrated on this page, direct connected to the propeller. The engine is of four-cycle, single acting, direct reversing, patented mechanical injection common rail fuel system, and overhead camshaft. The cylinders are individual and are fitted with nichrome iron liners.

Engine

Name of Engine—Union Diesel; **Year**—1932
Builder—Union Diesel Engine Co.
Cycle—4; **No. of Cylinders**—6; **B.H.P.**—400
Acting—Single; **Injection**—Solid (Mechanical)
Bore—13½ in.; **Stroke**—20½ in.; **R.P.M.**—225
Piston Speed—770 feet per minute
Pressure Brake—79.8 lbs.; **B.H.P. per Cyl.**—66.6
Stroke to Bore—1.57; **Wkg. Str. per Rev.**—3
Length O.A.—21 ft. 9 in.; **Width O.A.**—5 ft. 2 in.
Height O.A.—10 ft. 5 in.; **Weight**—76,000 lbs.
Weight—Pounds per brake horsepower—190
Reversing—Direct, by sliding camshaft
Air Compressor—Single stage, for maneuvering

Vessel

Name—Belle; **Type**—Log raft towboat
Owner—Preston Mann Towing Co., Vancouver
Completed—Converted to deisel, June '32
Type of Drive—Single screw, direct connected
Length B.P.—84 ft. 6 in.; **Beam**—18 ft. 7 in.; **Draft**—8 ft.
Speed—Towing, 2 to 3 miles per hour
No. of Propellers—One
Fuel Capacity—In bunkers, 800 imperial gals.
Fuel Consumption—Lb. per B.H.P. per hr.—0.42; pounds per day—4000
Radius Without Refueling—18 days operation
Generators—Two, 3 k.w., 25 k.w. diesel drive

Remarks

This vessel was previously equipped with steam power and it was decided to change to diesel engine power to reduce operating cost and to greatly increase radius of operation on a single fueling. The Belle is used especially for long towing in the waters of British Colombia.

During conversion from steam to diesel drive, the tug was further modernized by the installation of an electric-driven anchor windlass and an electric drive towing winch.

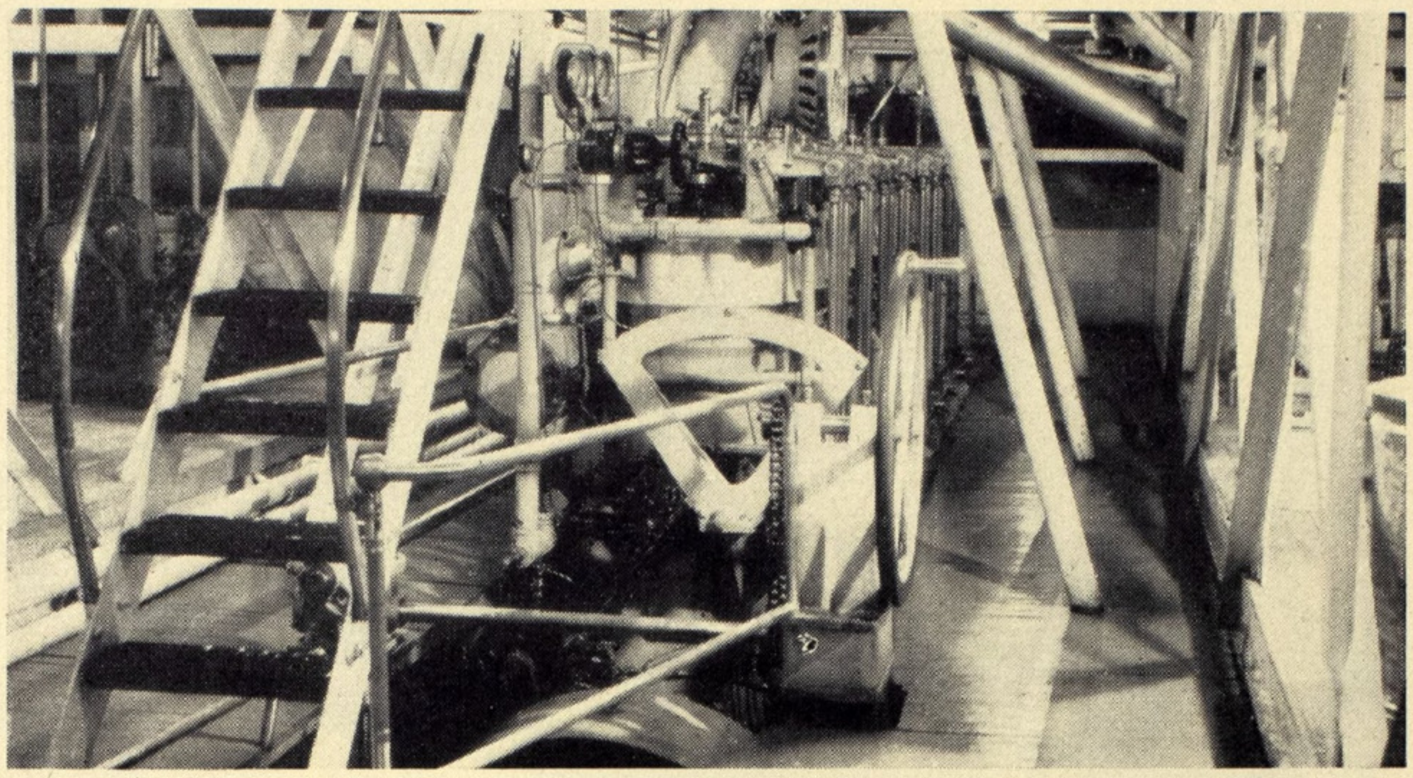
The economy and simplicity of operation of the diesel engine in this kind of service and for this power gives this type of drive an exceptional advantage over a steam plant.

Diesel Direct Drive in Ferry Leschi

One Engine—560 B. H. P.

DESCRIPTION

This engine of four-cycle, eight cylinders, double ended, non-reversing type has been installed in the ferry LESCHI and drives a propeller at each end through a clutch at each end of the engine. Both clutches are controlled by a single hand wheel at the engine operating station. Only one clutch is engaged at a time. This arrangement has been found in practice to be entirely satisfactory.



Engine

Name—Washington-Estep; **Year**—1932
Builder—Washington Iron Works
Cycle—4; **No. of Cylinders**—8; **I. H. P.**—650
B. H. P.—560; **Action**—Single; **Injection**—Solid
Scavenging—None; **Piston Cooling**—Air
Bore—14½ in.; **Stroke**—18 in.; **R. P. M.**—250
Piston Speed—750 r. p. m.; **Press. Ind.**—86.9 lbs.
Pressure Brake—74.7 lbs.; **B. H. P. per Cyl.**—70
I. H. P. per Cylinder—81.2; **Mechanical Eff.** 86%
Stroke to Bore—1.24; **Wkg. Strokes per Rev.**—4
Lgth. O. A.—37 ft. 3 in.; **Height O. A.**—10 ft. 2″
Width Overall—4 ft. 8 in.; **Reversing**—None
Weight—118,000 lbs.; **Per B. H. P.**—210 lbs.

Vessel

Name—LESCHI; **Owner**—King County, Washington
Builder—Rebuilt by Lake Washington Shipyards
Type—Double ended automobile ferry. Steel hull
Completed—Built by Duthie 1915, converted 1932
Main Drive—One diesel engine, clutch connected
Length O. A.—162 ft.; **Beam**—Hull, 33 feet.
Depth—8 ft. 4 in.; **Speed**—In knots, 11
Number of Propellers—Two, one at each end
Fuel Consumption—Lb. per b. h. p. per hr.—0.42
Generator—One Westinghouse, 26 k.w., 450 r. p. m., d. c.; 44 h. p. Washington diesel drive

Remarks

The ferry LESCHI is one of the most unusual conversions from steam to diesel power ever made on the Pacific coast. The vessel is of steel construction and was originally built as a side wheel steam ferry in 1915 at the Duthie Shipyards. Increased operating costs and the need for speedier service made it necessary to repower the old vessel or to build a new ferry.

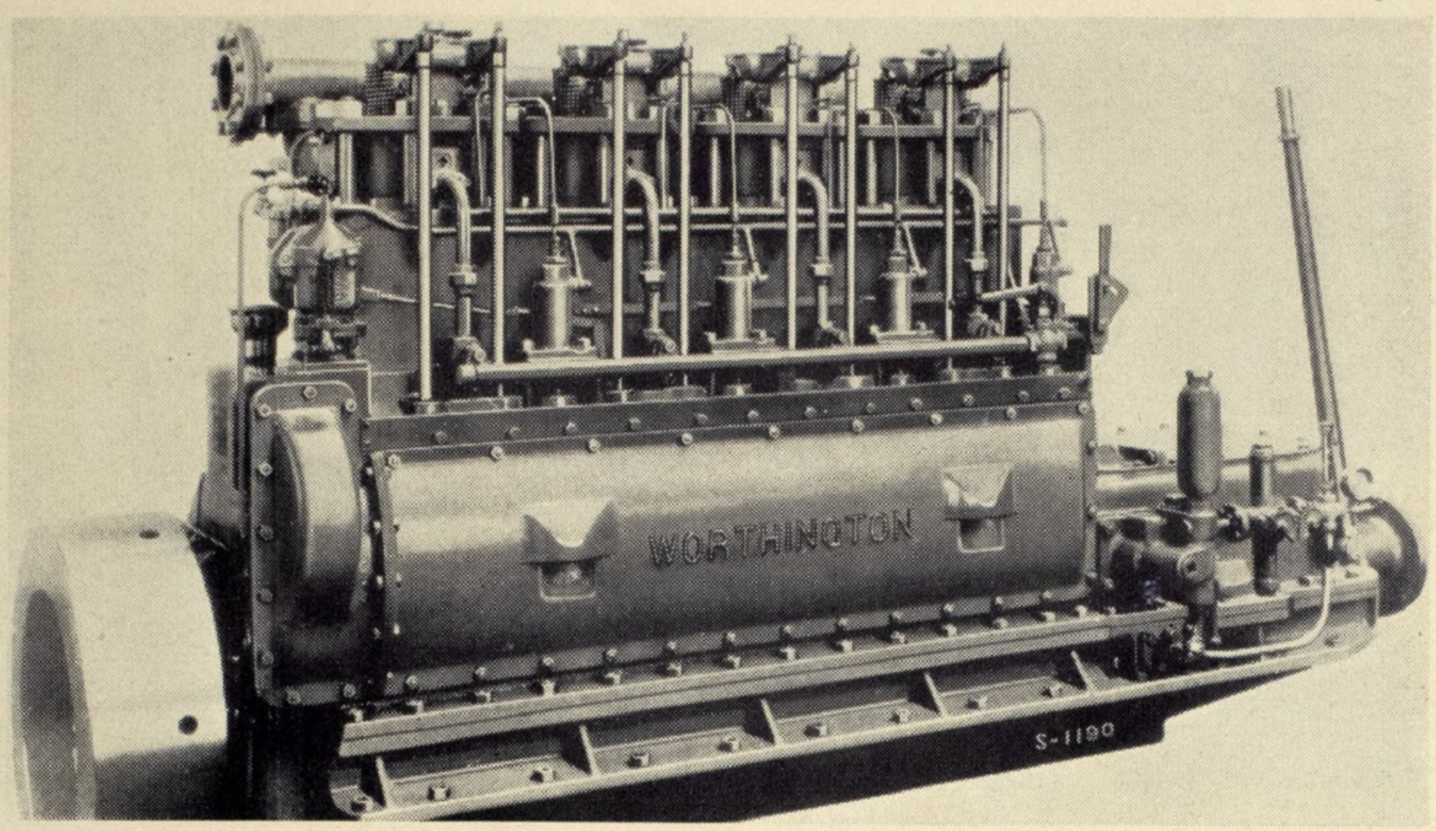
It was decided to convert the old vessel and to install a diesel engine. To do this a section of the bottom of the ship was cut out and an elliptical bulb or hull fin projecting some four or five feet below the bottom was fitted to the hull to provide the necessary room for the new power plant.

The accompanying engine room photograph shows that a considerable part of the engine is located below the bottom of the old hull.

With the 560 horsepower diesel engine the ferry LESCHI now has a speed of 11 knots.

Diesel Direct Drive in Schooner Fish Hawk

One Engine—100 B. H. P.



DESCRIPTION

This two-masted fishing schooner, equipped for trawling, is fitted with a four-cycle, four-cylinder, 100 brake horsepower diesel engine of the type shown in the accompanying illustration. It is a vertical, trunk-piston, single-acting, diesel engine of latest design with built-in reverse gear. It is economical in operation and is ruggedly constructed to stand up under hard service.

Engine

Name of Engine—Worthington; **Year**—1932
Builder—Worthington Pump & Machinery Corp.
Cycle—4; **No. of Cylinders**—4; **B. H. P.**—100
Action—Single; **Injection**—Solid; **I. H. P.**—133.3
Piston Cooling—Air; **Bore**—8″; **Stroke**—10½″
R. P. M.—500; **Piston Speed**—875 feet per min.
Pressure Indicated—100; **Pressure Brake**—75
B. H. P. per Cyl.—25; **I. H. P. per Cyl.**—33.3
Mechanical Eff.—75%; **Stroke to Bore**—1.31
Length O. A.—10 ft. 9 in.; **Height O. A.**—5 ft. 6″
Width O. A.—3 ft. 8 in.; **Weight**—11,200 lbs.
Reversing—Reverse gear and clutch. Larger engines are fitted for direct reversing.
Air Compressor—One single stage, 4½ x 2¾

Vessel

Name—Fish Hawk; **Type**—Fishing Schooner
Owner—Captain P. A. Pettersen
Main Drive—Single screw, diesel direct
Length B. P.—63 feet; **Beam**—17 ft. 6 in.
Depth—11 feet, 6 inches; **Draft**—8½ ft. 9 in.
Speed—In knots, 10; **No. of Propellers**—one
Fuel Capacity—Bunkers, 15 bbls.; or 2.3 tons
Fuel Consumption—Lb. per b. h. p. per hr.—0.42
Radius Without Refueling—1000 miles

Remarks

The Fish Hawk is a two-masted fishing schooner used for trawling. One of the interesting features of this installation is that the engine represents the final design of a new line of four-cycle, solid injection, moderate speed, diesel engines for marine propulsion and auxiliary service developed by the builder. The design for these engines was decided upon only after a number of years of experimentation and operation under working conditions. As a result the design may be said to incorporate all the wealth of experience of the builder in this type of machinery.

The engines are simple, rugged, dependable and easily accessible. Furthermore, it has been possible in the building of these engines to standardize on what is established good practice. In small and moderate powers this engine is the successful answer to a deliberate and careful attempt to combine engineering technique and practical experience.

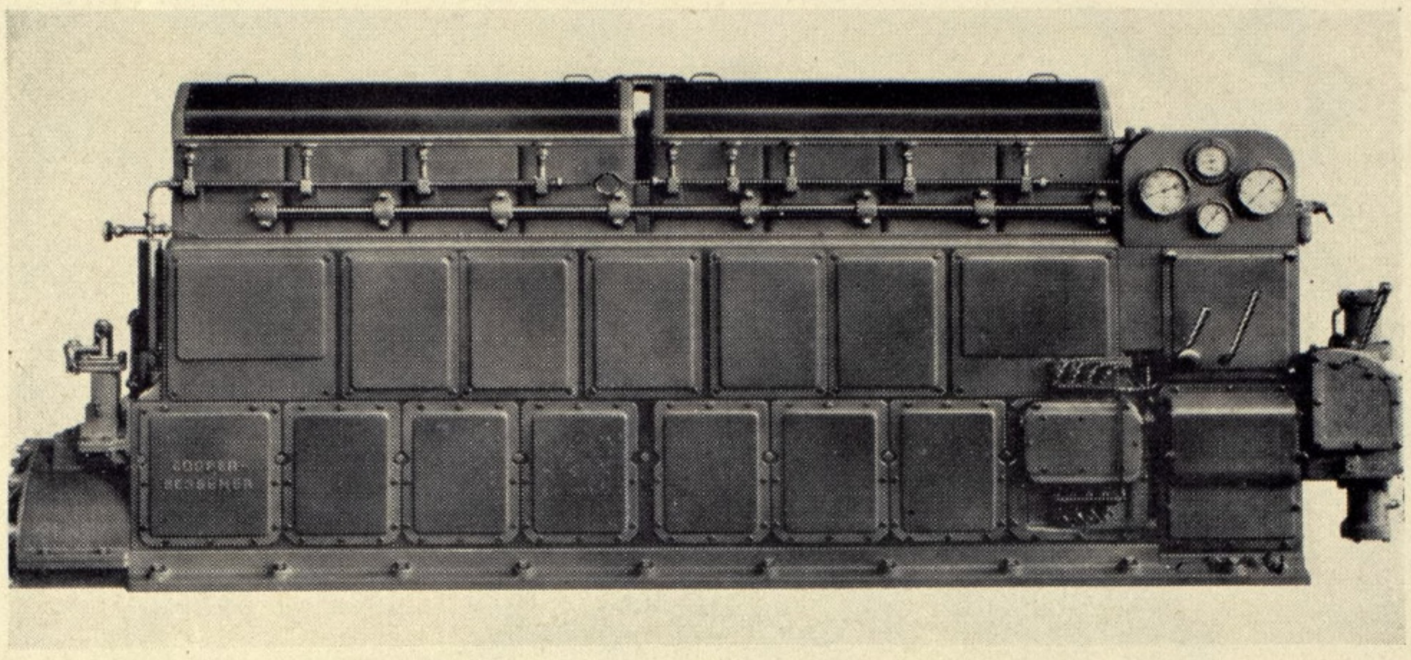
Some of the features may be enumerated. Injection, of course, is solid, and individual fuel pumps supply fuel to each cylinder through fuel lines of equal length. Admission of starting air to each cylinder is controlled by individual pilot valves. The spray valves are pressure actuated.

Diesel Electric Drive in Tug Dearborn

Two Engines—Each 330 B.H.P.

DESCRIPTION

This tug is propelled by a single, direct current, double armature electric motor developing 500 b.h.p. at 125 r.p.m. Electric current for the propelling motor is supplied by two generator sets, each driven by one eight-cylinder diesel engine of 330 horsepower, as illustrated and described here.



Engine

Name of Engine—Cooper-Bessemer; **Year**—1932
Builder—The Cooper-Bessemer Corp.; **Cycle**—4
No. of Cyls.—8; **B.H.P.**—330; **Action**—Single
Injection—Mechanical (Solid)
Piston Coolg.—Air; **Bore**—9 in.; **Stroke** 12 in.
R.P.M.—490; **Piston Speed**—980 feet per minute
Pressure Brake—85 pounds per sq. inch (mean)
B.H.P. per Cyl.—41; **I.H.P. per Cyl.**—48
Mech. Efficiency—85%; **Stroke to Bore**—1.33
Working Strokes per Revolution—4
Weight—21,000 lbs.; **Lbs. per B.H.P.**—70
Reversing—None; **Air Compressor**—Independent

Vessel

Name—DEARBORN; **Type**—Tug (Great Lakes)
Owner—Ford Motor Co.
Builder—Great Lakes Engineering Works
Completed—July 20, 1932
Main Drive—Single screw diesel electric
Length O.A.—85 feet; **Beam mld.**—21 feet
Depth mld.—13 feet; **Draft**—12 feet
Speed—12 miles; **No. of Propellers**—One
Main generators—Two Westinghouse, 205 k.w. each direct connected to diesel
Propulsion Motor—One Westinghouse, d.c., 500 B.H.P. at 125 R.P.M.
Auxiliary Generator—One 7½ k.w., also pump and compressor, driven by Hill diesel

Remarks

This fine modern diesel electric tug is of substantial steel construction and is designed for harbor service without crew accommodations. The electric motor is directly connected to the propeller shaft through a Kingsbury thrust. The propeller is of solid cast steel with four blades and is 8 feet 6 inches in diameter and 10 feet 6 inches in pitch.

The full horsepower of the propelling motor may be applied at reduced revolutions which is one of the outstanding advantages of electric drive for a tug. Without sacrificing engine efficiency, the maximum horsepower can be used in maneuvering. Furthermore, control of this power may be exercised at will either from the pilot house or the engine room. In this way the pilot has complete control over the propelling power at all times which is a very important factor when working in close quarters or in backing and filling when handling tows into or out of harbors.

The economy of an outfit of this type will also be good. Taking in the electrical losses, consumption per shaft horsepower per hour delivered to the propeller will probably not exceed ½ pound of diesel fuel. With a bunker fuel capacity in diesel fuel of 15 tons and at a speed of 12 miles per hour, the radius of action without refueling will be 1600 miles.

« EDITORIAL »

Finding Work for Shipyards An Urgent Problem

INDIFFERENCE to the fate of shipbuilding is probably due to a widespread lack of appreciation of the key position occupied by this industry in the welfare of the nation. The very high cost and the inefficiency of an attempt at hasty improvisation in the highly skilled and technical art of building successful modern ships for peaceful pursuits or purposes of defense in time of trouble would seem to be self evident. Any steps that can be taken at this time to fill in the gaps due to practical cessation of demand for merchant tonnage should be taken promptly.

Reference is made specifically to placing contracts at once with private yards for building three destroyers. By act of congress 1916, six destroyers were authorized. The secretary of the navy recently awarded contracts for building three of these destroyers, one each to the navy yards at New York, Philadelphia and Boston. This work will of course give employment to many workers but it does little or nothing for the nation as a whole in preserving and maintaining efficient establishments with trained and co-ordinated staffs capable of turning out merchant as well as war ships.

It is not to be wondered at that government executives become wary of suggestions from interested sources. Any plea on the part of a shipyard president or the authorized representative of the industry is immediately discounted. It is looked upon as more propaganda, another lobby. The represented extreme peril to the industry unless favorable action is taken does not make much of an impression on the ccld bureaucratic heart. It sounds to him merely as another and very ancient cry of wolf.

With agriculture and almost every industry in the country on its knees one can have some sympathy for the harassed leaders of government when they are asked to take action which on the face of it would seem to be of direct benefit to a single industry. Nevertheless it would be wise action to take every aggressive step possible at this time to allocate to private shipyards whatever ship construction it is intended ultimately to carry out. It would have several points in its favor.

1. It would keep men employed who, without additional orders, will soon be out of work and it would give employment to others now idle.

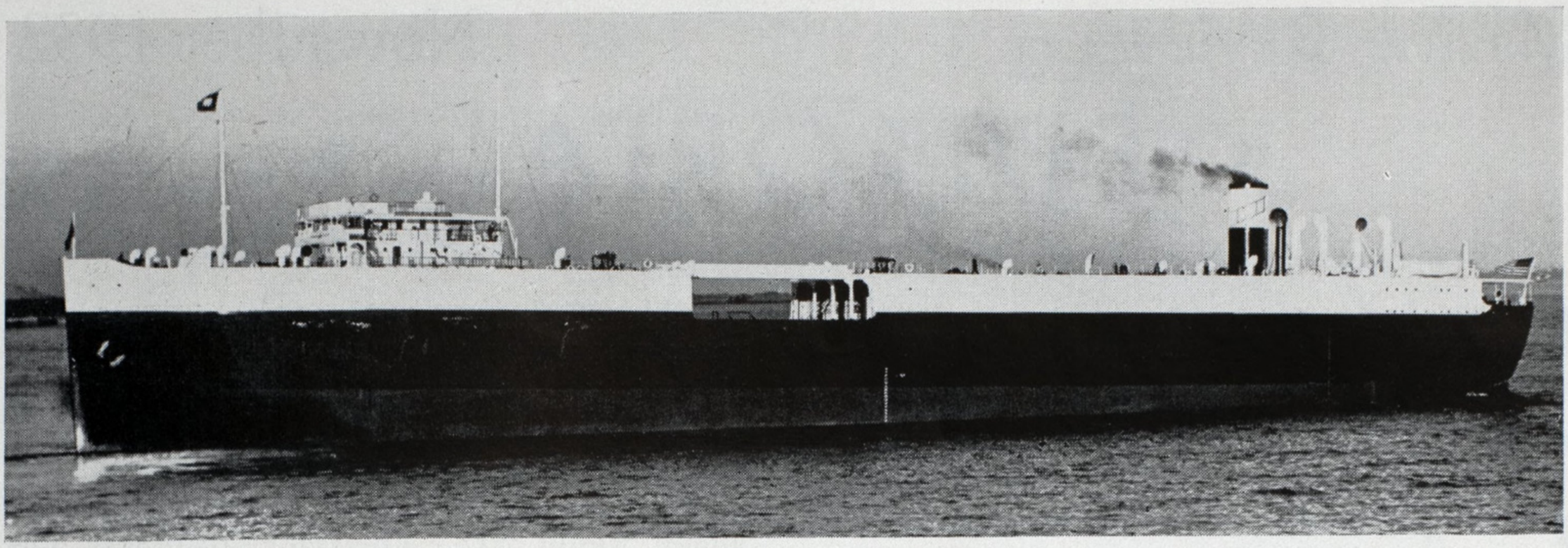
2. A substantial saving would result because of the present low costs.

3. Many allied industries would be called upon to furnish the widest range of materials from steel to bricks and also furnish equipment and machinery of the greatest variety.

4. In benefiting shipbuilding, by keeping trained technical staffs and other skilled leading workers in active and efficient organizations, it would benefit the entire country. In other words, it would preserve and keep in good workable condition a most valuable tool as an all important factor in helping to maintain and promote seaborne commerce by its fitness to build goods ships at a reasonable cost.

Individual initiative is the driving force behind the talents of mind and hand that have made nations great in achievement. This force has functioned with remarkable effectiveness in the United States. After three years of shattered confidence however its magic power has been woefully weakened. It needs a stimulant. Such a stimulant can be administered by leadership.

The President could call to Washington the responsible heads of all companies in the country owning and operating floating equipment with the view of stimulating initiative at this time in taking stock of present equipment for the purpose of planning and energetically carrying out a program of replacement of worn out, obsolete and inefficient units. Even a cursory survey shows that many units now in operation ought to be replaced as a matter of ordinary good business sense were it not for the paralysis of initiative. Many excuses and reasons why it couldn't be done would undoubtedly be offered. But we are inclined to think much in the way of effective results would follow. By directing attention to definite needs of replacement, action is bound to be accelerated in some degree at least.



Seatrain New York, One of Two Sister Ships Recently Completed by Sun Shipbuilding & Dry Dock Co.

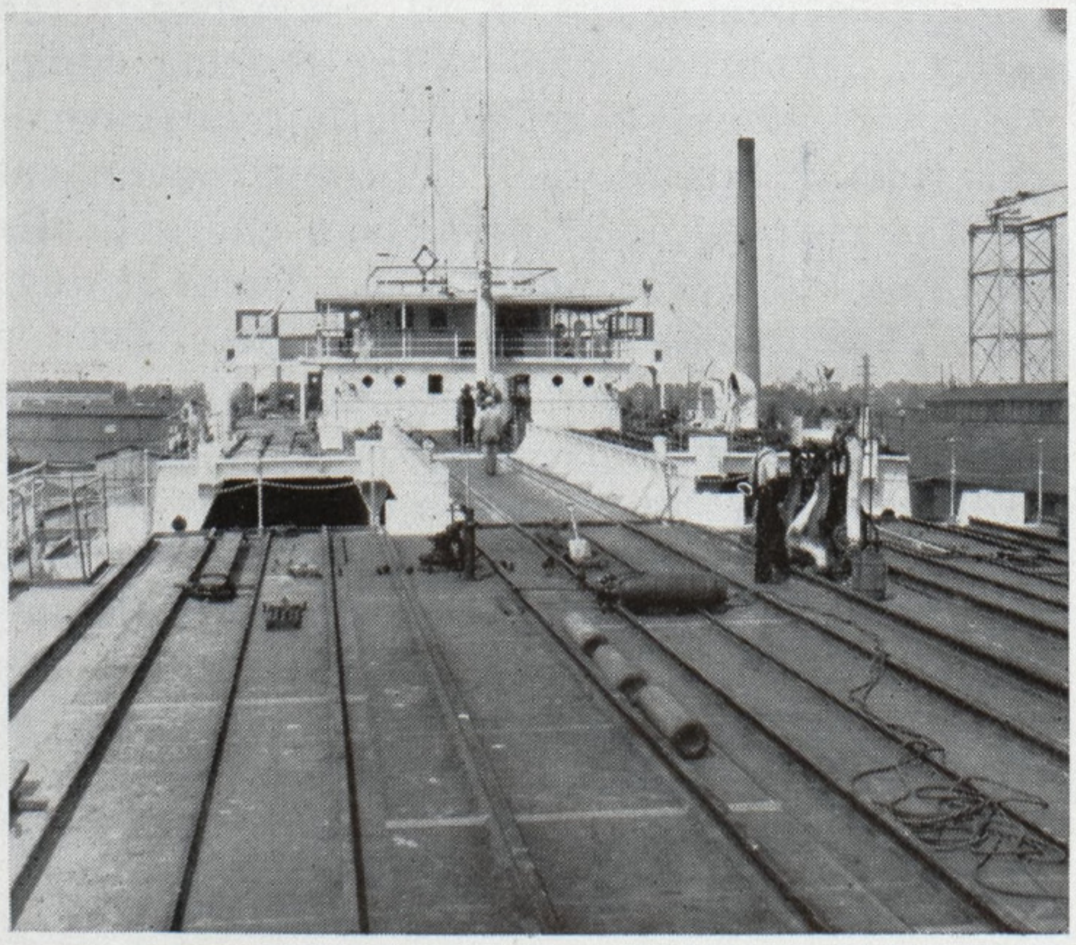
SEATRAIN NEW YORK

And Sistership in New York---Havana---New Orleans Run

TWO new and unique American built ocean going freight vessels for transporting cargoes of loaded railroad freight cars entered service in October. The vessels named SEATRAIN NEW YORK and SEATRAIN HAVANA were built by the Sun Shipbuilding & Dry Dock Co., Chester, Pa., for the Seatrain Lines Inc., New York, with terminals at Hoboken, N. J., New Orleans and Havana. The SEATRAIN NEW YORK was launched Sept. 14 and sailed on her maiden voyage to Havana from the terminal at Hoboken, N. J., Oct. 6. The SEATRAIN HAVANA, launched Sept. 26, sailed from Hoboken on her initial voyage to Havana and New Orleans on Oct. 13.

Thus is inaugurated out of the nation's chief port one of the most revolutionary changes in ocean freight transportation since the replacement of sail by steam. Though this system of transportation had its inception when the first vessel of this type, the SEATRAIN NEW ORLEANS, built in England for the same owner, entered regular service between New Orleans and Havana in January, 1929, the full effect of this extraordinary method of carrying cargo was not so widely recognized until this invasion of the port of New York. It is fair to say that no transportation event of recent years has aroused such widespread interest nor so much opposition and resentment on the part of old line, long established transportation agencies both ashore and afloat.

The United States shipping board has granted the company temporary permission to operate for a period of six months pending the board's consideration of "the effect of this operation with respect to present carriers and the development of new business." It is understood that during this period no mail compensation will be paid. The interstate commerce commission has denied the petition of nine railroads for the right to bar the interchange of freight with these ships. Consequently, this project now seems to be on the way to complete on a larger scale a successful practical demonstration of a new method of ocean transport. If successful, as the New Orleans-Havana service in operation for over 3½ years seems to leave no doubt it will be, the effect on present transportation methods is bound to be far reaching.



Seatrain New York — Superstructure Deck Looking Forward Showing Location of Rails For Stowage of Railroad Cars. Cars are Securely Clamped in Place

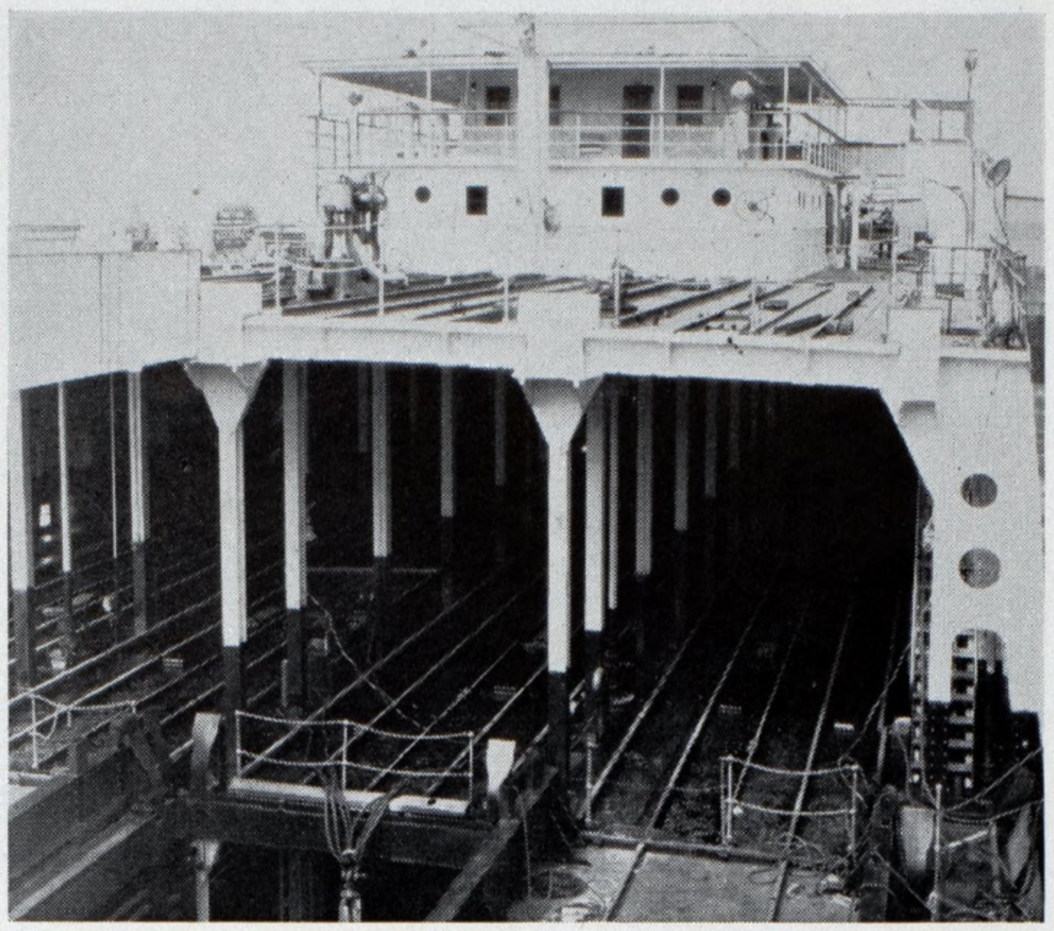
The new vessels are similar in line but larger and faster than the original vessel of this type, the SEATRAIN NEW ORLEANS, described and illustrated in MARINE REVIEW, February, 1929. Each ship will carry 100 loaded freight cars, equivalent to a mile long train.

They are not of the carferry type, in which the cars are run from the shore rails onto the vessels, but are large well proportioned vessels which have the appearance of tankers. The loaded cars are lifted from the shore rails and placed aboard the ship upon rails which are laid on four decks. The details of loading operations will be given later in this article.

These vessels are now maintaining a weekly service between New York, New Orleans and Havana. They are among the fastest cargo ships afloat, having a speed of 16.5 knots,

and their schedule calls for arrival in Havana from New York on the morning of the fourth day and New Orleans on the sixth day. Terminal and handling facilities have been installed in Hoboken, N.J., similar to the terminals in New Orleans and Havana which have been in use since the service between the two latter ports was inaugurated in 1929.

Particular care has been taken in the design and construction to insure maximum seaworthiness. The hull is built on the Isherwood longitudinal system of construction. A complete double bottom and oiltight longitudinal bulkheads on each side of the vessel abreast the car stowage space provide a continuous double skin from the machinery bulkhead to the forepeak bulkhead. The side tanks formed by the longitudinal bulkheads are for carrying liquid cargo.



Seatrain New York—Railroad car hatch looking forward. The freight cars are hoisted through this hatch by means of a crane on shore. The car rests on a cradle brought to the respective deck levels and is then moved to position on board

All Decks Carry Cars

The full length of her superstructure extends to the stem to act as an airstream line guide. Decks are, superstructure, poop, main and tween or second decks. There are two masts, fore and aft. The superstructure, main, tween decks and hold are all laid with steel rails for carrying railroad cars and with jack rails for centering, securing and stowing them. Machinery space is located in the extreme stern.

Suitable arrangements are made for trimming to an even keel, fore and aft and athwartship, whatever the variation of cargo weight may be. Cargo pumps are located in two watertight pump rooms.

One of the features of the construction of the hull is the use of special steel. The main and superstructure decks are built of copper bearing steel and stainless steel has been used for fittings where resistance to corrosion is particularly needed. It is interesting to note that electric welding has been extensively used for securing fittings throughout the hull, and the rails are secured to the decks in the same manner. Special framing, shell and deck plating have been used in connection with the structure in way of the carloading hatch in order to maintain strength and rigidity.

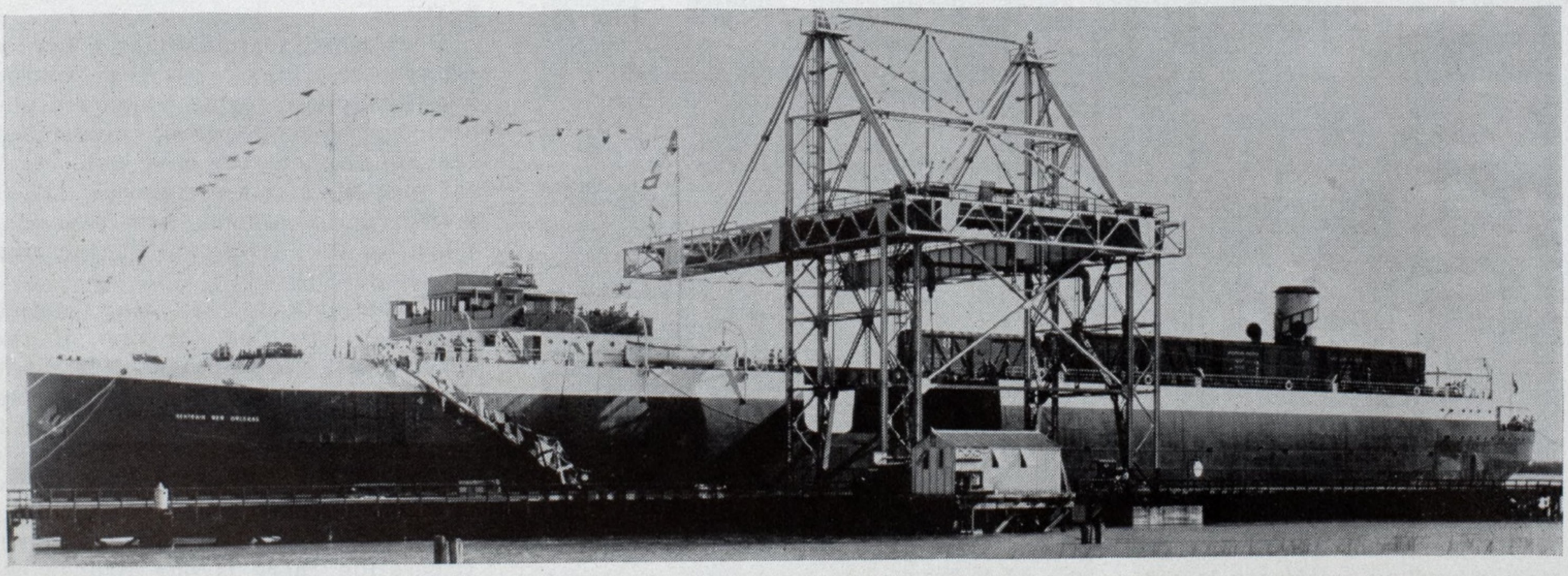
Captain and officers' quarters are located in the steel deck house on the superstructure deck forward. The crews' quarters are located aft. The crew list is about as follows: captain, chief officer, second officer, third officer, radio operator, boatswain, four quartermasters, ten seamen, steward, cook, assistant cook, four mess boys, chief engineer, second, third and fourth engineers, deck engineer, three oilers, three water tenders, and three firemen. This is a total of 41 in the crew; 20 in the deck department, 14 in the engine department, and 7 in the steward's department.

General Particulars

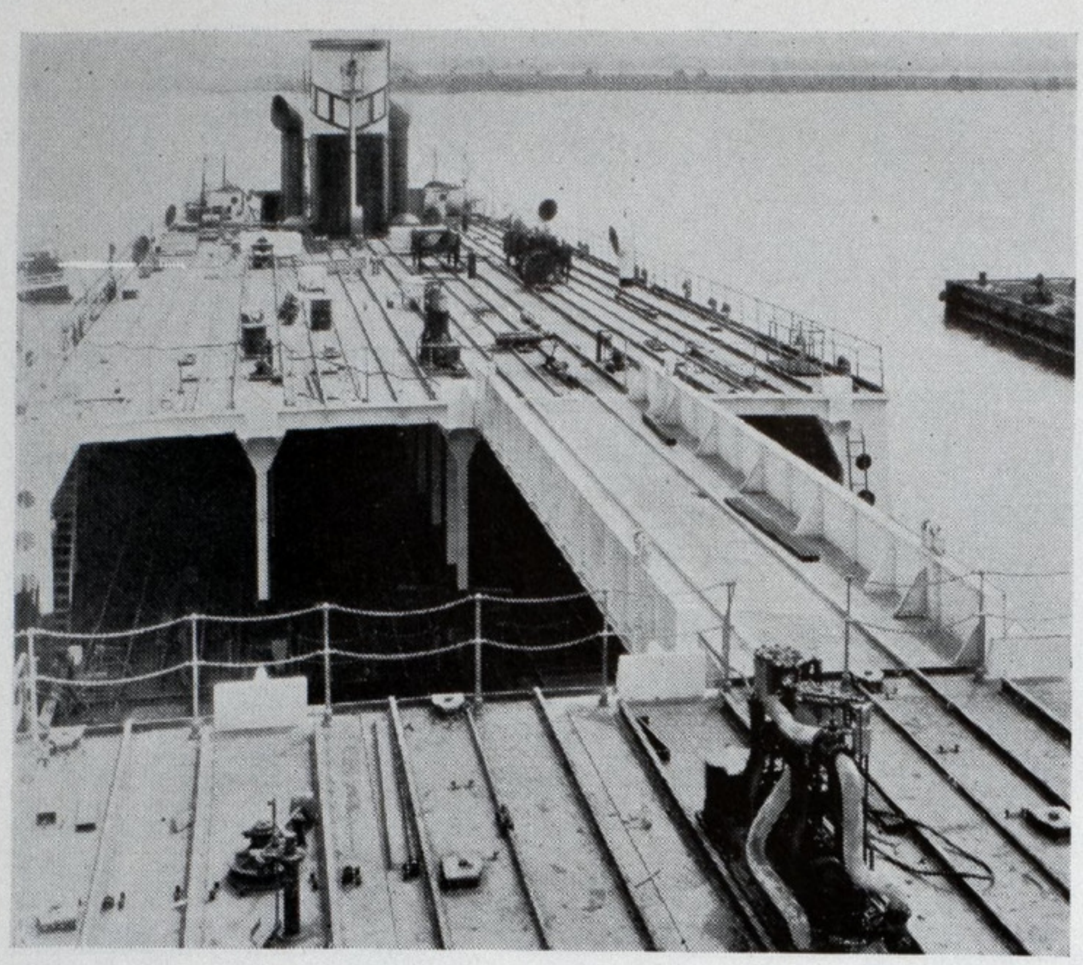
Owner	Seatrain Lines Inc.
Builder	Sun Shipbuilding & D. D. Co.
Launched, Seatrain New York	Sept. 14, 1932
Launched, Seatrain Havana	Sept. 26, 1932
Seatrain New York, Sailed	Oct. 6, 1932
Seatrain Havana, Sailed	Oct. 13, 1932
Length overall, feet, inches	478 0
Length between pp., feet, inches	460 0
Beam molded, feet, inches	63 6
Depth molded, Main Deck, ft., in.	38 3
Draft, loaded, feet, inches	22 3
Displacement loaded, tons	13,745
Deadweight, tons	8,445
Capacity, loaded railroad freight cars	100
Propelling machinery, geared turbine, single screw, with max. shaft horsepower	8,800
Boilers, oil burning, watertube	3
Working pressure, lbs. per sq. in.	400
Speed, in knots	16½

Main Propelling Machinery

Modern steam engineering has been applied in the design and layout of the propelling and auxiliary machinery. The propelling machinery is a De Laval compound turbine with double reduction gears driving the propeller shaft through a Kingsbury thrust bearing. Turbine and gears were designed and built by the De Laval Steam Turbine Co., Trenton, N. J. Each unit is rated at 8000 shaft horsepower at 105 revolutions per minute and will develop 8800 shaft horsepower at 110 revolutions per minute. The designed speed is 16.5 knots. The SEATRAIN NEW YORK



Seatrain New Orleans at New Orleans terminal. Crane lifts cars from dock into ship and vice versa



Seatrain New York — Superstructure deck looking aft, showing deck stowage for cars on rails

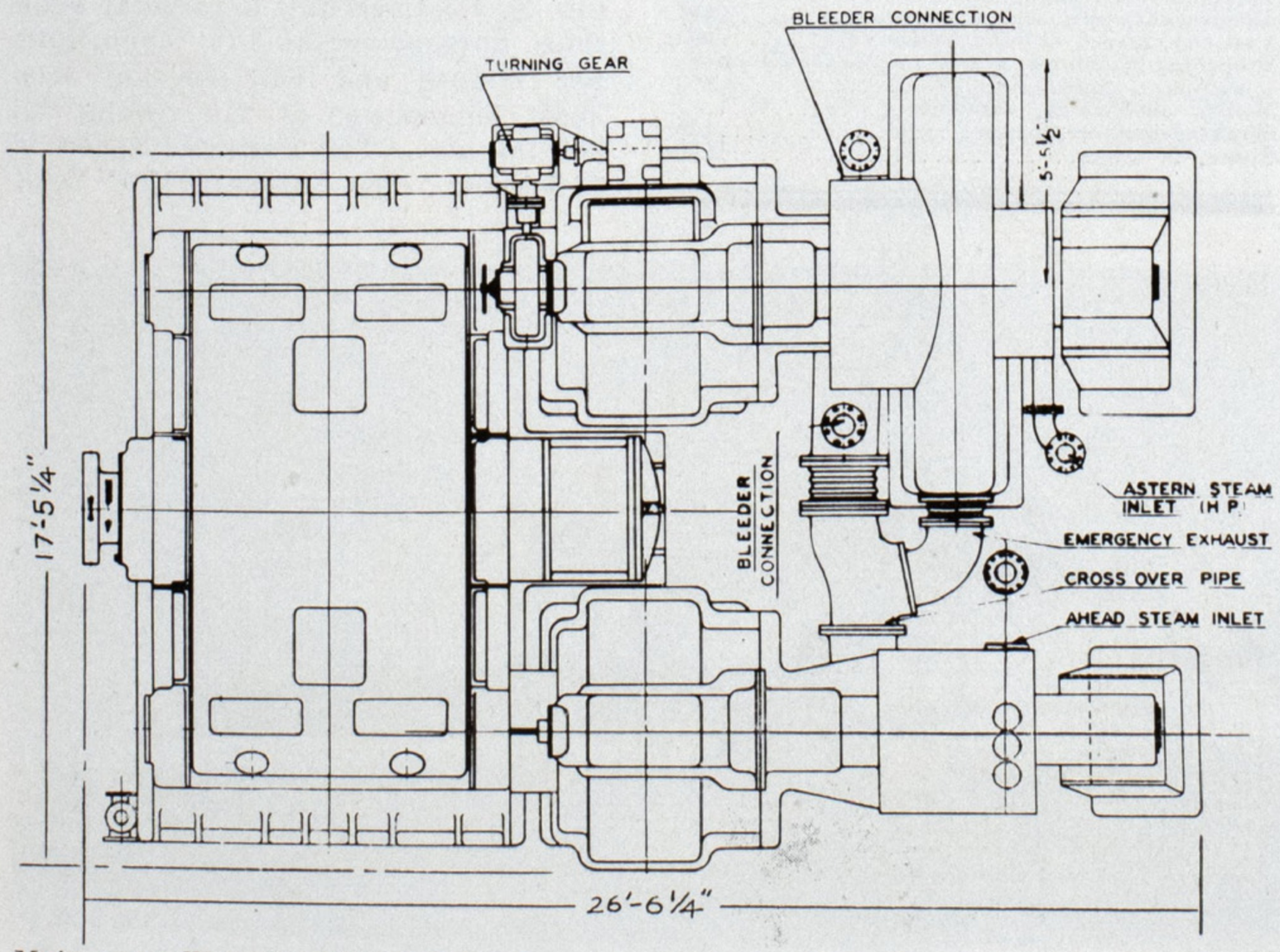
in her sea trials off the Delaware capes attained a speed of 17.1 knots. The main turbine takes steam of 375 pounds per square inch gage pressure, and 233 degrees Fahr. of superheat. The turbine exhausts to a vacuum of 28½ inches. The speed of the high pressure turbine at the designed propeller speed is 4685 revolutions per minute, and of the low pressure turbine, 3445 revolutions per minute. The reversing element, developing 3000 shaft horsepower, is located in the low pressure turbine casing.

The high pressure turbine casing is constructed of steel and the low pressure turbine casing of steel and nickel bearing semisteel, as is also the high speed and low speed gear cases. Complete turbine and gear units weigh 275,000 pounds.

Steam is provided by three Babcock & Wilcox watertube marine boilers of latest improved design with convection type superheaters. These boilers are oil-burning and each have a heating surface of 5564 square feet and superheating surface of 1044 square feet. The allowable working pressure is 400 pounds per square inch with a total temperature of approximately 700 degrees Fahr.

Fuel oil for the ship's own use is carried in the double bottom in way of the boilers and in tanks at the sides in the way of machinery space and in the after part of the side tanks in way of the cargo space.

A full line of auxiliary machinery and equipment has been installed and includes twin air injector and auxiliary condenser supplied by Foster Wheeler Co.; two oil coolers by Davis Engineering Co.; one oil purifier by The Sharples Specialty Co. In the pumping equipment are: two vertical centrifugal main condensate pumps; two centrifugal main circulating pumps; one centrifugal main feed pump; one vertical simplex auxiliary pump; one vertical simplex port feed pump; one vertical simplex general service and fire pump; one centrifugal emergency bilge pump; three centrifugal pumps, one each for sanitary, auxiliary condensate, and auxiliary circulating and oil cooler; one horizontal duplex emergency fuel oil service pump. All of the foregoing pumps were supplied by Worthington Pump & Machinery Corp. The same company also supplied one deaerating type first stage feed water heater and one single stage air compressor for pneumatic tools. The Davis Engineering Co. supplied one second stage feed water heater. For settling and bunker tanks there is installed a King-Seely telegage system. Other pump equipment includes one centrifugal, self-priming, ballast and bilge pump and a similar pump for forward ballast by the Nash Engineering Co.; two rotary cargo oil pumps and a similar fuel oil transfer pump of Waterous make; one evaporator feed pump, one fresh water pump, and one drinking water pump by Ingersoll-Rand Co.; two screw type fuel oil service pumps by Quimby; and one hand deck pump by Gould.



Main propelling machinery layout on the Seatrain New York, showing De Laval compound steam turbine and gear casing

Two Large Turbo Generators

For supplying electrical power there are two General Electric turbine driven generators 250 k.v.a., alternating current, three phase, 60 cycle, 220 volts. Current for lighting is supplied by three 10 k.v.a., 220 to 110 volt, single phase transformers. All of the engine room auxiliaries are electrically driven except the feed pump and general service pumps which are steam driven. The main feed pump is driven by a B. F. Sturtevant Co. turbine. Heating in the forward quarters is electrical throughout. Electricity is also used in the galley and for water heating.

Deck machinery includes a hydroelectric steering gear, spur geared windlass, one mooring winch aft, one dock type gypsy forward, two vertical car hauling engines and two vertical electric hoists for stores, all of which deck equipment has been supplied by the American Engineering Co., Philadelphia.

A complete refrigerating system has been installed for one of the cargo decks. Arrangement is made for piping connections to each car on this deck which is loaded with perishable cargo. To supply this cargo refrigeration there are two Brunswick-Kroeschell 20-ton, refrigeration units. For ship stores refrigeration there is one Brunswick-Kroeschell 1½-ton, motor-drive unit.

Navigating equipment is most complete and of modern type throughout including a Sperry gyro-compass. The propeller is a four-bladed, solid type Slocum wheel of 17 feet 9 inches in diameter. The rudder is a semi-balanced streamline type.

The seatrain type of vessel was developed by Graham M. Brush, president of the Seatrain Lines Inc. As noted earlier in this article, the first vessel conforming to these ideas was built in England and has been in constant service between New Orleans and Havana since January, 1929. The two new American built ships described in this article embody Mr. Brush's original ideas with additional modern improvements for faster and larger ships.

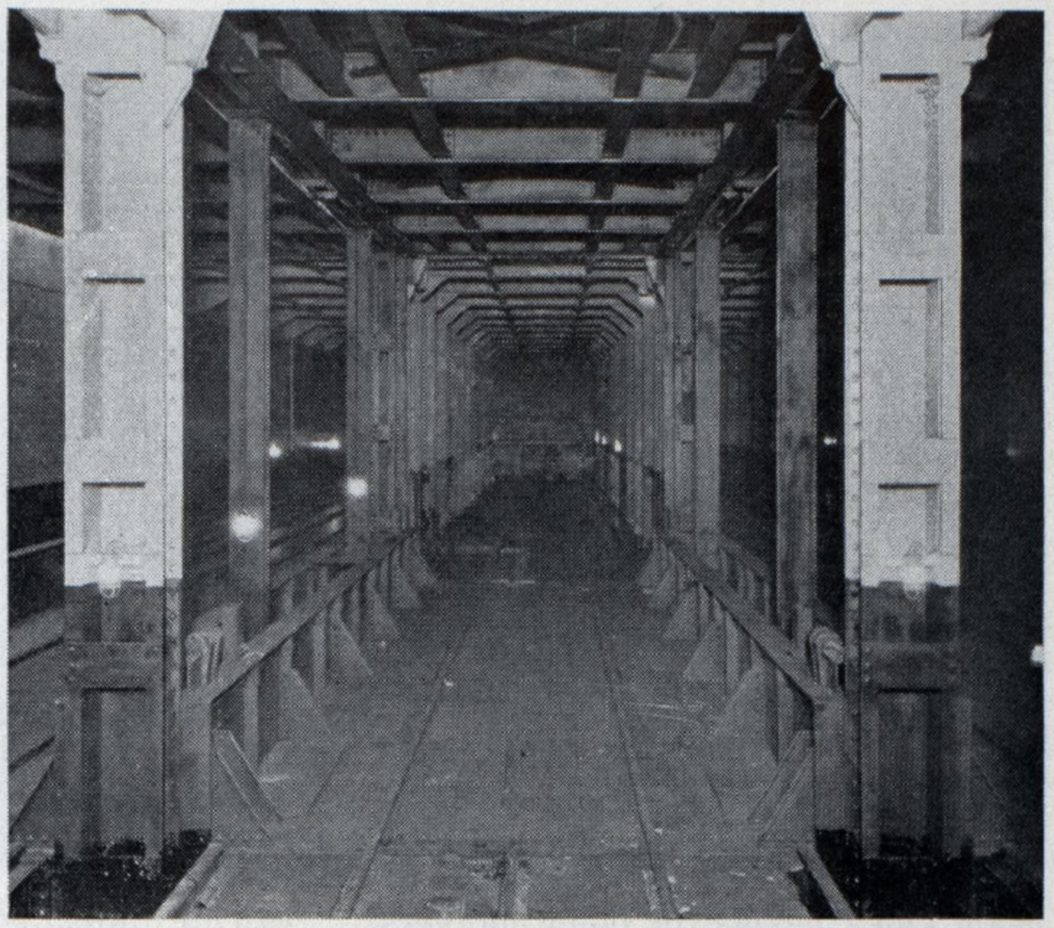
Special car-lifting cradles are provided for the four tracks on each of the decks. The upper deck cradles are arranged to be watertight and serve as hatch covers.

How Railroad Cars Are Handled

Railroad cars are lifted from the shore tracks aboard the vessel by means of specially designed cranes which are located on the dock at the terminal. By means of these cranes the loading and unloading of freight cars from the vessel can be done at the same time. In the loading operation, the cradle, which is fitted with tracks, is placed in a gap in shore tracks and the loaded freight car is run on the cradle. The crane then lifts the cradle, with the car upon it, up over the vessel's side and lowers it into the hold, making a connection of the cradle rails with the deck rails.

A mechanical car-handling device inside the ship shunts the car from the cradle on the deck tracks. While this cradle is still in place, a car intended for unloading from the vessel is placed upon it by the car handling device. This car is then lifted on the cradle from the hold of the ship and placed upon the dock. The car is then shunted from this cradle and another car intended for loading takes its place, and is in turn placed on the vessel.

The cars are held in place on the rails in the ship by screw jacks secured to the special jacking rails and by means of special quick-operating rail clamps. The loading crane is so arranged that it will lower the cradle over the different tracks as necessary to keep the vessel properly trimmed, and the process of loading and unloading is continued. When the four tracks on one deck have been filled, the cradles are put into place. These cradles act as hatch strong backs; each cradle has a car on it, secured in place just as the other cars are secured in place on the decks. There are no switches from one track to the other in the hold of the vessel.



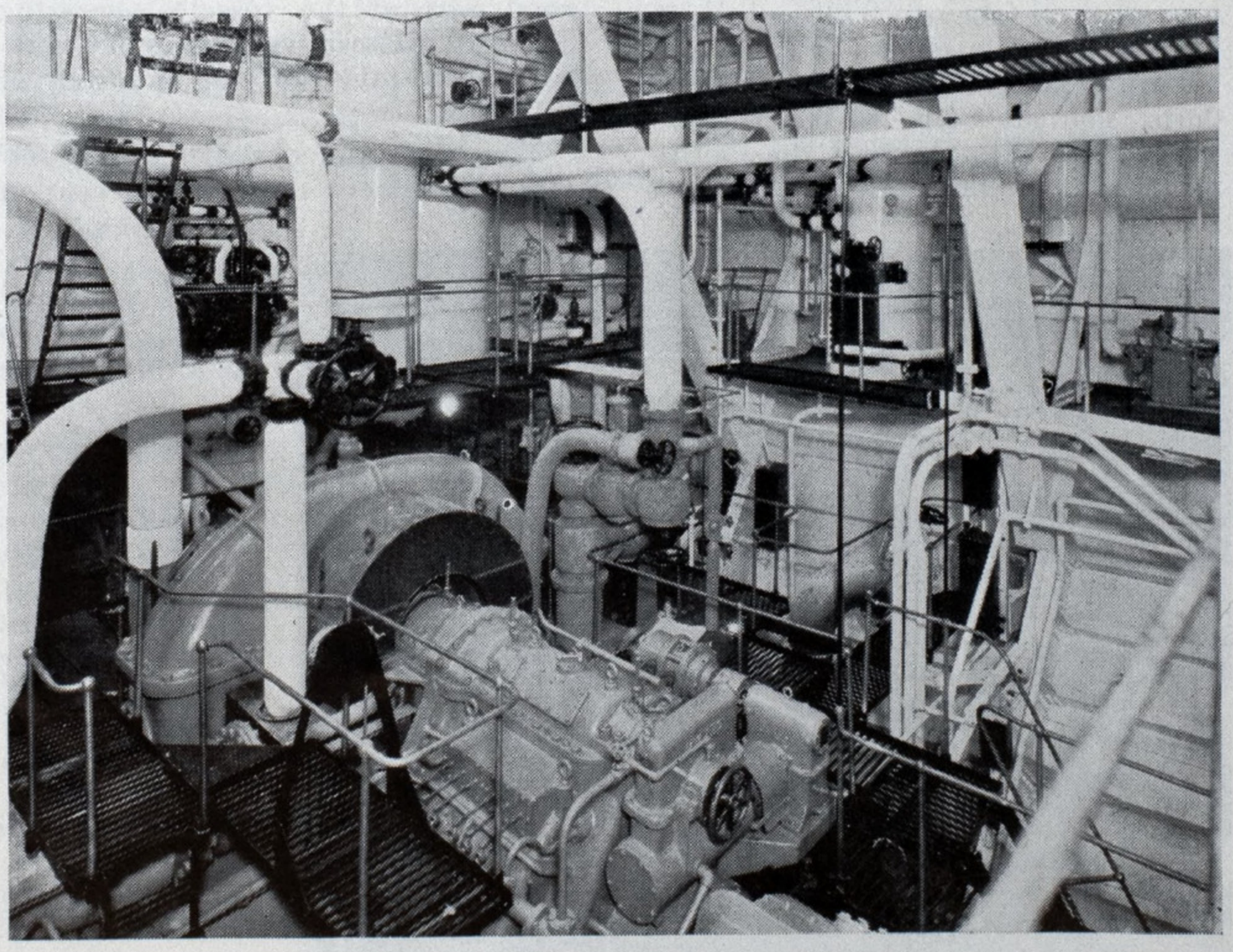
Seatrain New York — Main deck, showing rails for car stowage in interior of ship

Any doubt as to the practicability of handling freight cars in this way, due to the lost space in the vessel, is dispelled by the saving in handling time, the elimination of labor cost and a quick turn around of the ship which more than compensates for any loss of space.

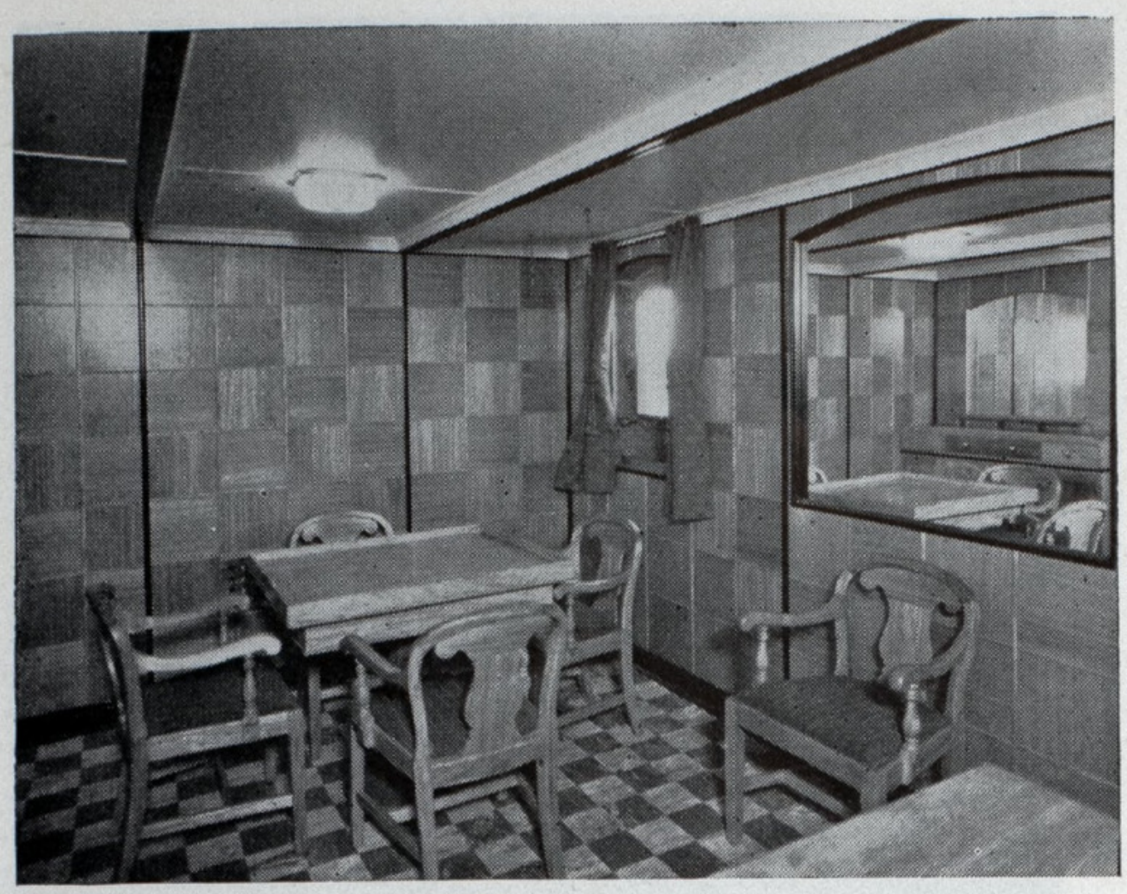
There are certain kinds of commodities impossible to handle or transport overseas with profit by any other means.

Cars are lifted on and off the vessels at the terminals by special design cranes as shown in one of the accompanying illustrations. These cranes are electrically operated. The cranes at the New Orleans and Havana terminals are of the following description:

The main structure is supported on four legs with a clear distance between these legs of 57 feet in the direction of the pier, and at right angles to the pier the distance center to center of legs is 35 feet. The height of the tower is 104 feet. The length of trolley travel is 88 feet 6 inches. The horizontal boom is hinged near the front column so that the boom can be raised when not in use. Hoisting drums for the boom and a 40-horsepower motor are located on a rear platform of the trolley track level and the hoisting of the boom is accomplished by means of cable over sheaves at the top of the tower. The main hoisting machinery is mounted on trolley girders (spanning the main girders, which reach out over the ship) and consists of two drums each driven by 250-horsepower motors. The crane columns are made of 14-inch Carnegie



Engine room on the Seatrain New York—Turbine geared drive, single screw, 8800 shaft horsepower, maximum at 110 revolutions per minute



Main saloon of the Seatrain New York. Well arranged and attractively furnished

beam and I beams for boom hangers. Each of these cranes contain 220 tons of structural steel. Both cranes were built by the Shaw Putman Crane Co., Muskegon, Mich. They are electrified by General Electric equipment. The controller is of the rheostat type with master switches and designed for operation from the crane cab. These cranes each have a lifting capacity of 115 tons on an extreme reach which is approximately one foot greater than the width of the ship. The cranes are designed for extremely quick operation, having a lifting speed of 50 feet per minute.

The crane for the new terminal in Hoboken has similar operating characteristics but with modern and improved designs. The capacity of this crane is 125 tons. The handling of cars by this method greatly reduces the time and cost of loading and discharging of cargo and therefore reduces the time these vessels have to spend in port. The crane was built by Shepard Niles Crane & Hoist Corp., Montour Falls, N. Y.

Each of these vessels, has a capacity of 100 cars. All of these cars can be unloaded and an equal number loaded into the vessel in a period of approximately 10 hours, that is, 100 cars can be removed from the vessel and 100 other cars placed on board at an average rate of about three minutes per car.

Saving in Port Expense

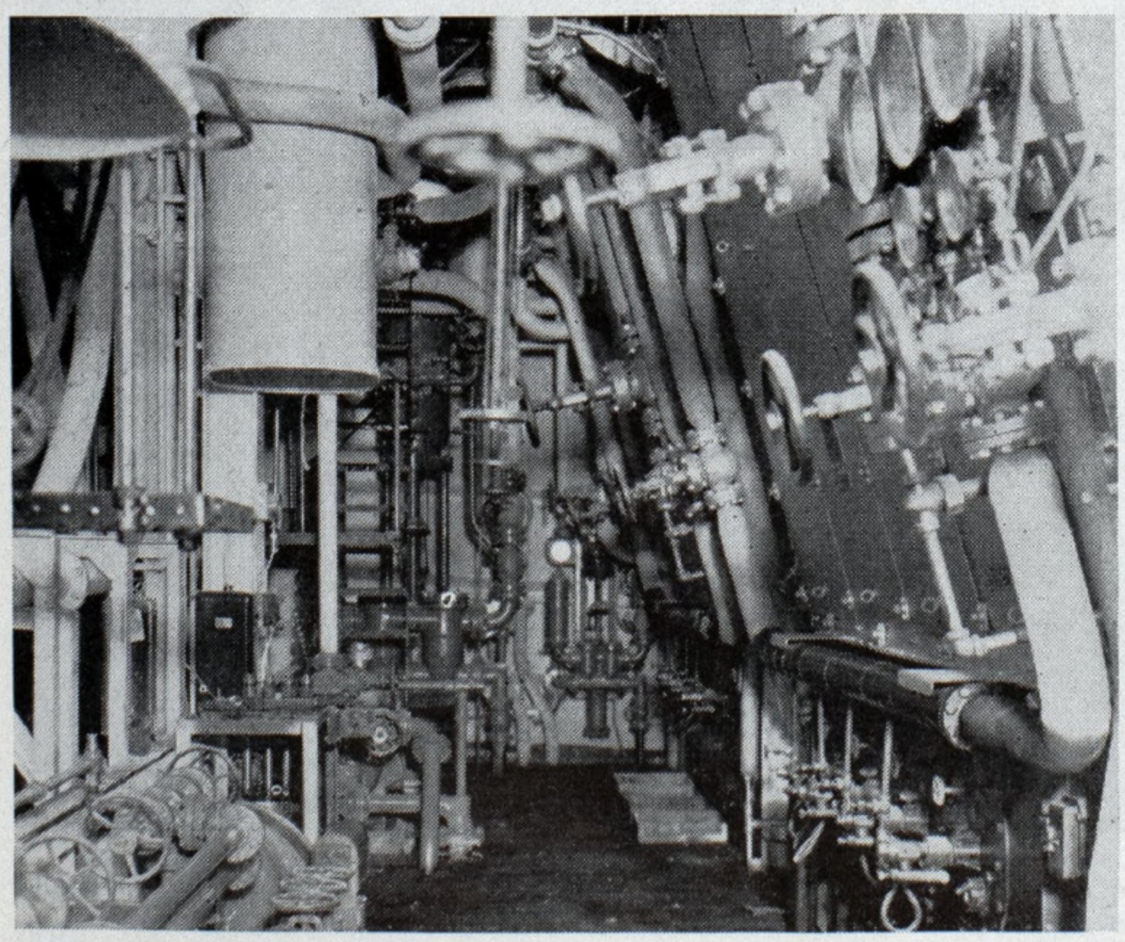
In this new method of cargo handling, the cost of receiving, checking, weighing and handling of cargo at terminals together with the maintenance of covered terminals in the loading and discharging of the cargo is practically eliminated thereby greatly reducing the cost from that of the ordinary peice-meal handling of cargo. These vessels can be loaded and discharged in a single working day with only a few men and if necessary with only the ship's crew, therefore saving a large amount of terminal expense and also, by reason of the quick turn around saving a good part of the vessel's operating expense. These vessels lend themselves favorably to the handling of perishable cargo.

Coastwise and nearby foreign vessels spend more than 50 per cent of their time in port for loading and discharging their cargo. The seatrain vessels are at sea 84 per cent of their time, therefore approaching tanker and ore carrier turn around. The SEATRAIN NEW ORLEANS is now operating from New Orleans to Havana in 52 hours, and unloading and loading 95 cars at each port in 10 hours. The distance from New Orleans to Havana is a little more than 600 miles. Allowing 104 hours for time at sea and 20 hours for port time, time at sea is approximately 84 per cent. The two new seatrain ships, being faster vessels, will of course reduce the time between New Orleans and Havana.

Any type of cargo can be handled by these vessels. In addition to freight now being hauled by railroad, new business will be given to the railroad by these vessels, partly due to the perishable cargo above referred to, and partly due to trade from certain territories of commodities which heretofore could not be moved by the railroad because all rail rates are in general much higher than water rates. Railroads will also benefit indirectly, in that seatrains make it economically possible to move traffic from interior points now too far from the ports to compete with other localities because of the long rail hauls. By saving in packing charges and other expenses, shippers are able to handle goods from points deeper in the interior than they can do by the ordinary steamship lines. When the cars leave or enter the railroads, the loading cradles at the terminals are the interchange points and cars while in the possession of the seatrain ships are handled on the same basis as if handled by a connecting railroad.

Using freight cars at sea for carrying goods is economical. The cars (which act as containers) eliminate the necessity of packing merchandise in whole or part. A great saving to the railroad company, which at present must absorb the expenses of making deliveries of cargo to and from ships, is made by eliminating the necessity of loading and discharging cars. The cost of breakage is minimized. The losses in such cargoes as sacked goods, through shifting and through holes made by hooks of longshoremen and through spoilage by contact with other cargo, is entirely eliminated. There is greatly diminished danger of pilferage, and there is a saving in insurance due to carrying goods in sealed containers.

This new method of transportation should fit well into the economical structure of the United States at the present time. The country is so dependent upon its transportation system, that any new method of moving freight which combines safety, speed and economy, is of vital importance.



Boiler room on the Seatrain New York. Three oil burning watertube boilers. Working pressure of 400 pounds and total temperature 700°

Society of Naval Architects, Annual Meeting

THE Society of Naval Architects and Marine Engineers was founded in 1893 with the object of "the promotion of the art and science of shipbuilding, both commercial and naval, in the United States of America." During the nearly forty years since its foundation, a wealth of technical knowledge has been accumulated largely from a membership including outstanding figures in the professions of naval architecture and marine engineering.

Efforts of the society from its inception have been devoted to developing the best practices in ship design and construction and to present this cumulative fund of knowledge to the industry in its transactions. This has been the fundamental purpose of the society.

The activities of the society center about the annual meeting which provides an opportunity for men of attainment to present and discuss technical subjects on various phases of shipbuilding and allied arts. They must bear the mark of high professional standing on the part of the author and must discuss some important practical or technical aspect of naval architecture or marine engineering or a closely allied subject.

Offices of the society are located in the Engineering Societies building, 29 West Thirty-ninth street, New York. Affairs of the society are directed by a council consisting of the president, past presidents, honorary vice presidents, 12 vice presidents, 27 members of council and a secretary-treasurer. Direct management of the society is vested in an executive committee of nine composed of seven members of the council, elected annually by the council, and the president and secretary-treasurer, ex-officio.

A committee on papers is appointed annually to pass upon all papers prepared and submitted for consideration at meetings. In order to start work on papers early in the year, members are requested to offer suggestions for subjects to be considered at the next annual meeting.

Membership of the society comprises honorary members, honorary associates, benefactors, permanent members, life members, life associate members, members, associates and juniors.

Application for membership in the last three grades is made on a regular form furnished by the secretary, which requires a statement of the professional position held by the applicant with a record of technical training and professional experience.

Membership in the society offers many advantages. In addition to the bound transactions containing all papers presented at the annual meeting, all classes of membership have the free use of the Engineering Societies Employment service, and also receive bulletins of the Engineering Index service, which contain references and brief synopses of articles of marine interest.

The society, as in the case of many others, has been affected by the present economic conditions. At this time every member is urged to bring the advantages of membership in this society to the attention of eligible persons. The usual admission fee of $15 will be omitted for all persons elected to membership this year. The annual dues of members and associates are $15 and juniors $10.

Naval Architects Meet in New York, Nov. 17-18

THE fortieth general meeting of the Society of Naval Architects and Marine Engineers will be held in the auditorium of the Engineering Societies building, 29 West Thirty-ninth street, New York City, Thursday and Friday, Nov. 17 and 18. Sixteen papers are scheduled for presentation at the professional sessions, which will begin each day promptly at 9:30 a.m. The council of the society will meet at 3 p.m. Wednesday, Nov. 16 in the board room on the fifteenth floor of the Engineering Societies building.

On Thursday, Nov. 17, at 7 p.m., a dinner-dance will be held on the new Panama Mail steamship SANTA ROSA. An opportunity will be offered during the evening to inspect the vessel, which is the most recent addition to the passenger liner fleet of the United States.

The annual banquet will be held in the grand ballroom of the new Waldorf-Astoria hotel, Forty-ninth street and Park avenue, New York City, on Friday evening, Nov. 18, promptly at 7:30 o'clock. Members and guests should use the grand ballroom entrance on Forty-ninth street. Immediately preceding the banquet a reception will be held beginning at 7:00 o'clock. Titles of the sixteen papers, names of authors, and the order in which the papers are to be delivered follow:

Thursday, Nov. 17, 9:30 a.m.

1. *Trial Analysis Methods*, by Lieut. A. S. Pitre, (CC) U. S. N., visitor.
2. *Measurements of the Propulsive and Structural Characteristics of Ships*, by Dr. Gunther Kempf, member.
3. *Propeller Cavitation*, by Capt. E. F. Eggert, (CC) U. S. N., visitor.
4. *Tests on Three Geometrically Similar Ship Models*, by Commander H. E. Saunders, (CC) U. S. N., member.
5. *Welding Longitudinal Seams of Shell Plating*, by Leon C. Bibber, visitor.
6. *Education of Naval Constructors and Naval* Architects, by Rear Admiral George H. Rock (CC) U. S. N., (retired), vice president.
7. *Stability of Ships After Damage*, by J. C. Niedermair, member.
8. *Raising the* S. S. SEGOVIA, by Harold F. Norton, member.

Friday, Nov. 18, 9:30 a.m.

9. *Structural Hazards on Shipboard*, by S. D. McComb, member.
10. *Resistance of Flat Surfaces Moving through a Fluid*, by Karl E. Schoenherr, member.
11. *Elastic Characteristics of a Naval Tank Vessel*, by Lieut. Wendell P. Roop, (CC) U. S. N., visitor.
12. *Propulsion Turbines and Gears for Panama Mail Steamships*, by A. R. Smith, visitor.
13. *Performance of the* MARIPOSA *and* MONTEREY, by J. E. Burkhardt, member of council.
14. *Performance of Standard Oil Tankers*, by R. L. Hague, member.
15. *Modern Power Plant Practice and Its Application to Marine Work*, by R. C. Roe, visitor.
16. *Machinery for Modern Cargo Ships*, by J. H. King, member of council.

Better Feeling in European Shipping

More Optimism is Clearly Indicated

By Frank C. Bowen

IT IS difficult to say that there has been any distinct improvement either in shipping or shipbuilding in Europe during the last three months, yet the sky seems to be appreciably lighter without giving the observer any direct opportunity of pointing to signs of fairer weather. There is no doubt that the whole shipping world seems to have a feeling that things will be on the mend before very long.

With regard to British shipbuilding, and a certain section of shipping as well, the key piece is the new Cunarder whose construction is still suspended although she has been the subject of infinite rumor. The popular press has tried to stir up public opinion in the matter by talking about the prestige of the country, the employment that she would afford, and a score of other things.

Whatever may happen, the Cunard company is not going to be hurried into a false position, although it naturally cannot forget that it already has £1,800,000 lying idle in the ship. It is generally believed that the arrangement eventually will be a government guarantee of a loan on reasonable terms. This will not be easy to arrange. It wants very delicate handling and negotiation.

Italian Shipping to the Fore

The Italians fully realize the value of the biggest or fastest, and in their present keen campaign to persuade American holiday makers to start in Italy instead of France or northern Europe they find the new liners REX and CONTE DI SAVIOA the very best of handles. In Italy the most wonderful tales have been told about their features; abroad this tone has been modified and the owners of the ships and the Italian state have satisfied themselves with a plain description of the ships and what they will be able to do. They really are remarkable ships, far and away the finest under the Italian flag and a more ambitious job than has ever been tackled before by Italian yards. It is unfortunate that the REX had such a breakdown on her maiden voyage. Failures in the machinery of a brand-new ship before it has had time to run itself in are, of course, well known and there is no reason to believe that the REX will not prove a conspicuous success.

Of course the REX and CONTE DI SAVIOA occupy the center of interest in Italian shipping, and they will have a big influence on Western ocean travel, but from the purely shipping point of view they are little if any more important than the NEPTUNIA and OCEANIA of over 20,000 tons, which have been built for the cabin service to South America. Although not the biggest ships on the South American service they are not far behind, and their construction and luxurious fitting revolutionize the idea of cabin travel on that route. They have, in fact, introduced North Atlantic standards into the South Atlantic run. Considering that a good deal of the tonnage on this run is getting old it will shortly have to be replaced.

This naturally adds to the difficulties of those in charge of the new Royal Mail lines, who are salving the South American interests of the Kylsant group. They have taken over the fleets which formerly ran to South America on the various Kylsant services, often treading on one another's toes and even in direct competition with one another, and the 50 ships are now all being run as a definite entity. The fleet thus collected is admittedly what the huntsman would call a "bobbery pack" but nearly all the ships were designed for the South American service and there is at least a sound basis on which the new fleet can be built up, for a new fleet will certainly be necessary before very long.

Replacements Are Necessary

Replacements are obviously necessary in a good many directions, but before they can economically take place it is necessary to clear the decks of a good deal of surplus tonnage. Therefore, compulsory laying up and scrapping schemes are the order of the day, just as they have been in every serious shipping slump in the last half-century.

No matter what scheme has been put forward it is always met with strong opposition, generally due to the fact that most shipowners believe that salvation is to be found in the elimination of unsound companies, and that any scheme which is carried into effect will give these concerns new life at the expense of well managed and more soundly founded rivals. The "survival of the fittest" is apt to operate rather cruelly but it cures many ills. In the meantime Germany has put into operation an expensive scrapping scheme at the cost of the state, but even this has been received with many grumbles and has had to be rectified on many points.

In truth, with the price of old ships for scrap seldom exceeding six shillings per ton gross, the shipowners would have little temptation to dispose of their old ships in this way were it not for the expense of keeping them laid up. The British India line has sold ships of the "M" class, built in 1913 and 1914 at that price, but the greatest sacrifice of all is by the Leyland line, which has sold its BOSTONIAN, better known as the Dominion liner RIMOUSKI, to scrappers for only £3400. As she is a ship of 9000 tons gross, built as recently as 1918, it would appear that she would be worth keeping laid up rather than selling at such a sacrifice, but her record tells another story. Completed in July, 1918, she ran until January, 1921, was then laid up until November, 1924, ran until January, 1927, laid up until November, 1928, ran until March, 1929, and has been laid up ever since.

Ship Wrecking Not Lucrative

Fine ships sold at such prices suggest that the business of shipbreaking should be one of the most promising in Europe at the present time, yet there is very little in it. Rijsdijks in Holland and Wards in Britain are the two most important shipbreaking firms and they tell the same depressing story in their annual reports which have just been published. To begin with, of course, there is great difficulty in finding a market for their products when steel is so down, and it must also be remembered that they are now faced with far more competition than they were only a short time ago. With no indication of orders coming in, the shipbuilders both in Britain and on the Continent are turning to scrapping work one after another in order to keep their skilled men available.

The Italian state subsidy for tramps is beginning to have precisely the effect that was foretold of it by those who had experience of the working of the French navigation bounties under the 1881 and 1893 laws. As far as keeping Italian tonnage in commission is concerned there is no doubt that it is a success, although an expensive one for the taxpayers, but whether it is really worth while retaining the ships which are being run under it instead of going to the scrappers is quite another matter. And as far as

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This is a quarterly review of the shipping situation abroad, appearing regularly in MARINE REVIEW. The three previous articles for this year were published in the February, May and August issues.

Trend of Trade and Shipping in British Isles

	June	July	August	Eight months ended Aug. 31 1932	Eight months ended Aug. 31 1931
Total entrances of cargo ships into British ports:					
Number of vessels	4,435	4,256	4,584	32,730	36,805
Tons	5,128,382	5,024,473	5,127,539	37,406,069	39,892,878
Tonnage from Atlantic coast of North America	1,030,918 (20%)	1,018,784 (20.2%)	926,158 (18.1%)	6,310,624 (16.9%)	7,367,830 (18.5%)
Total clearances from British ports:					
Number of vessels	4,447	4,641	4,253	34,388	36,539
Tons	4,645,017	4,802,625	4,504,706	35,596,005	38,733,823
Tonnage going to Atlantic coast of North America	886,431 (19.1%)	837,434 (17.4%)	752,251 (16.7%)	5,260,277 (14.8%)	6,267,187 (16.1%)
Total value of goods:					
Exported	£33,898,473	£32,598,445	£32,043,245	£281,005,179	£307,038,889
Imported	£55,517,501	£51,921,493	£53,312,814	£465,943,418	£553,094,289
Exports of coal:					
Tons	3,430,433	3,333,554	3,182,161	26,338,946	28,044,618
Value	£2,805,879	£2,762,968	£2,601,075	£21,294,170	£22,652,037
Tonnage shipped for use of steamers	1,090,080	1,180,414	1,184,232	9,487,967	9,449,011

the rest of European shipping is concerned there is no doubt that it is a terrible addition to their already great burdens. It has already had the effect of keeping down freights when they showed some slight indication to rise, not a very great one it is true, and there is no doubt that it will continue to be its results as long as it remains in force.

Cargo Ships Being Recommissioned

In spite of this depressing influence on tramp freights, there is still to be seen a gratifying tendency to recommission cargo liners. As an indication of the state of shipping, a cargo liner is of infinitely more importance than a tramp, and although there are still all too many idle round the British Isles there is no doubt as to the tendency.

Although the fast Dutch cargo liners have been collecting practically all the freights that are to be had on the routes which they cover, particularly to the East Indies, there are a number of Dutch companies in trades which are hard hit. Then came the unfortunate strike of seamen against the proposed reduction of wages, a strike which might have attained its object had not certain extremists gone out of their way to cause a loss to the owners.

The general body of Dutch seamen has undoubtedly suffered from the action of these extremists, for although they obtained their demand that the old rates should not be interfered with, the owners have decided to economize with the result that many ships which were laid up during the strike have been left out of commission and will remain so indefinitely. The exact sum that a man would have been earning had he been in work is not of very much comfort when he is out of a job, and it looks as if the Dutch seamen, as well as the Dutch merchant marine, will have to pay rather heavily for it.

It is still too early yet to say how and how much the Ottawa Imperial conference will affect British shipping and shipping to Britain. There is no doubt that the results of the Ottawa conference will come in for a good deal of keen discussion, and many prominent British shipping men have already expressed the opinion that the results will be far too much in one direction, and that while they should encourage the importation of many commodities they will probably mean empty holds in the outward journey.

Port Churchill, Hudson Bay

The new harbor of Port Churchill on Hudson bay is quite ready to deal with any increase in the transport of Canadian grain to Britain. The Canadian government is vitally interested in this scheme and has carried out a propaganda campaign almost unparalleled in commercial history. Its great purpose has been to allay doubts as to the safety of the new route, and it has been successful in so far that underwriters have made several concessions, although against their better judgment. Then, just when the Canadian authorities were trying to persuade them that Oct. 30 was just as safe a date as Oct. 15 as an end to the season, the tramp steamer BRIGHT FAN, of 3791 tons, hits an iceberg in the middle of Hudson straits and sinks in three hours. Her crew was saved, but the accident happened at an inconvenient time for the Canadian government.

New Shipbuilding Limited

The shipyards have little prospect of new orders with the tonnage market so overcrowded already, but they see no reason why a certain number of contracts should not come their way for modernizing existing ships. Naturally, the British yards are paying very careful attention to progress in Holland, where quite a number of cargo liners of insufficient speed are being brought up to date in that respect. The conversion of the forward part of the ship into the Maier form does not appear to have proved a very difficult task to these Dutch yards, or to some of their German neighbors, and with the instillation of exhaust turbines its general adoption would make welcome work for the British establishments. But hitherto British owners have been more inclined to limit themselves with the fitting of superheaters only, getting a considerable measure of economy at a very low price.

There is one exception in this and

(*Continued on Page* 50)

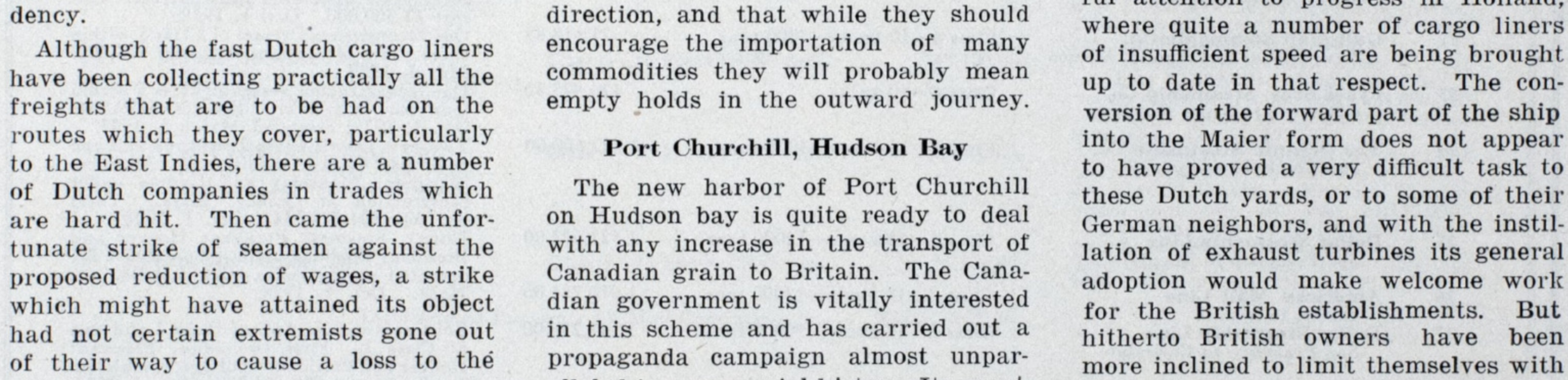

1928
1929
1930
1931
1932
Dec. Jan. Feb. March April May June July Aug. Sept. Oct. Nov.
60 55 50 45 40 35 30 25 20 15 10 5
"STATIST" INDEX OF BRITISH SHIPPING FREIGHTS
INDEX OF FREIGHTS BETWEEN U. S. A. AND WESTERN EUROPE- - -
AVERAGE OF 1920 RATES TAKEN AS 100

Diagram Showing Fluctuation of Ocean Freight Rates for Four Years and Eight Months

Mail Contracts Corrected to Date

Forty-Three Mail Contracts Awarded—Means Payment of $25,213,628.80 Annually—One Hundred and Twenty-Four Ships Are Specified

Ocean Mail Contracts Awarded to American Steamship Lines to Oct. 15, 1932

Route Number	Steamship Cos. & Termini	Class of Vessels Required at Start of Service	Est. Amt. Fiscal Year 1933	Class of Vessels Required. Date of Mail Contract
4	**Munson Steamship Lines** New York to Buenos Aires	Class 3—18 knots—12000 tons	$1,628,872.00	None Aug. 1, 1928.
5	**Export Steamship Corp.** New York to Mediterranean and Black Sea Ports	Class 6—10 knots—4000 tons	1,484,040.00	Eight new vessels, four of Class 4 and four of Class 5. Class 4 ships, Excalibur, Exochorda, Exeter and Excambion completed. Total est. cost, eight ships, $18,400,000. Aug. 1, 1928; supplemental contract, Dec. 10, 1929.
6	**American South African Line** New York to Beira, Portuguese E. Africa	Class 6—10 knots—5000 tons	285,522.00	Two new Class 5 vessels. First ship, City of New York (diesel) completed. Total est. cost $3,900,000. Oct. 1, 1928.
8	**Grace Steamship Company** New York to Valparaiso	Two of Class 4—16 knots Others of Class 5—13 knots	844,692.00	Two new vessels of Class 3. First ship, Santa Clara, completed; second vessel in three years. Total est. cost $7,000,000. Aug. 1, 1928.
15	**Eastern Steamship Lines** Boston to Yarmouth	Class 3—19 knots—5000 tons	301,464.00	None. Oct. 1, 1928.
16	**American Scantic Line** New York to Copenhagen	Class 6—10 knots—4000 tons	381,374.00	Eleven Class 5 vessels, reconstructed, at total est. cost of $2,529,480. Payments now made on basis of Class 5. Work to be done at stated intervals during period of contract. Oct. 1, 1928; supplemental contract Dec. 17, 1930.
17	**American West African Line** New York to West African Ports	Class 6—10 knots—4500 tons	295,550.00	Three reconstructed vessels of Class 5, one within fourth year and two during remainder of contract. Total est. cost $900,000. Oct. 1, 1928.
18	**Atlantic & Caribbean Steam Navigation Co.** New York to Maracaibo	Two of Class 5—13 knots Others of Class 6—10 knots	372,419.00	One reconstructed Class 5 vessel within third year of contract; est. cost $300,000. Oct. 1, 1928.
19	**Columbian Steamship Company** New York to Puerto Colombia	Class 6—10½ knots—2550 tons	468,253.00	Two new Class 4 vessels and one Class 5, not new, to be in service Jan. 1, 1933. Newport News S.B. & D.D. Co. lowest bidder on two ships at $4,600,000. Also one new vessel Class 4 (conditional) before end of fifth year. Total est. cost $6,750,000. March 1, 1930.
20	**New York & Cuba Mail SS Co.** New York to Havana	Class 4—16 knots—6000 tons	747,180.00	Two new vessels of Class 2; Morro Castle and Oriente completed and in service; total est. cost $9,815,179. Oct. 1, 1928.
21	**New York & Cuba Mail SS Co.** New York to Progreso	Class 5—14 knots—4500 tons	419,536.00	One reconstructed vessel of Class 5 within three years from award of contract. Est. cost $1,300,000. Oct. 1, 1928.
22	**Gulf Mail Steamship Co.** New Orleans to Progreso, Mexico	Class 6—10 knots—3000 tons	23,618.88	One reconstructed vessel of Class 5 within three years of contract; est. cost $75,000. May 1, 1929.
23	**Lykes Bros. Steamship Co.** Galveston to Santo Domingo	Class 6—10 knots	426,873.50	One reconstructed vessel of Class 5 within four years from award. Est. cost $229,564. Oct. 1, 1928; extended March 1, 1931.
24	**The Oceanic Steamship Co.** San Francisco to Sydney	Class 4—16 knots—4000 tons	1,122,600.00	Two new vessels Class 2 required and one new vessel Class 2 (conditional). All three, Mariposa, Monterey and Lurline under construction at Quincy, Mass. Total est. cost $24,289,034. Oct. 1, 1928.
25	**Dollar Steamship Line** San Francisco to Manila	Class 3—18 knots—12000 tons	1,521,672.00	None. Steamers President Hoover and President Coolidge, required on Route 27, operated on this route. Oct. 1, 1928.
26	**American Mail Line** Seattle to Manila	Class 3—18 knots—12000 tons	1,070,784.00	None. Oct. 1, 1928.
27	**Dollar Steamship Line** San Francisco to Colombo	Class 5—14 knots—10000 tons	1,141,296.00	Four new vessels, two of Class 2 and two of Class 3. First two ships, President Hoover and President Coolidge, completed. Total est. cost $31,402,370. Oct. 1, 1928.
28	**States Steamship Company** Portland to Manila	Class 6—10 knots—4000 tons	459,471.00	Two reconstructed vessels of Class 5, one during fourth year, and one during remainder of contract. Total est. cost $1,000,000. Oct. 1, 1928.
29	**States Steamship Company** Portland to Dairen, China	Class 6—10 knots—4000 tons	184,440.00	One reconstructed Class 5 vessel; est. cost $500,000. Oct. 1, 1928.
30	**Oceanic & Oriental Nav. Co.** Los Angeles to Auckland	Class 6—10 knots—4000 tons	99,015.00	None. Oct. 1, 1928.
31	**Oceanic & Oriental Nav. Co.** Los Angeles to Melbourne	Class 6—10 knots—4000 tons	214,397.50	None. Oct. 1, 1928.
32	**American Line Steamship Corp. (Panama Pacific Line)** New York to Balboa, Canal Zone	Class 3—18 knots—12000 tons	418,496.00	One new vessel, Class 3, (Pennsylvania) completed. Two similar new vessels, California and Virginia, already in service at start of contract. Est. cost each vessel $6,587,226. April 1, 1929.
33	**South Atlantic SS Co. of Del.** Savannah, Ga., via Brest to Liverpool; Savannah, Ga., via Plymouth to Bremen	Class 6—10 knots—4900 tons	360,210.00	Three reconstructed vessels of Class 6; est. total cost $353,870. Dec. 1, 1928.
34	**Pacific Argentine Brazil Line** San Francisco and Los Angeles via Bahia Blanca to Buenos Aires	Class 6—10 knots—4000 tons	353,041.92	Four reconstructed vessels Class 6 before third year of contract. Est. total cost $114,000. Jan. 1, 1929.
35	**Mississippi Shipping Co.** New Orleans and other Gulf Ports to East Coast of South America	Class 6—10 knots—4900 tons	741,196.00	Two new Class 5 vessels; total est. cost $3,900,000. Four reconstructed vessels Class 5 (two completed); total est. cost $1,040,000. July 5, 1930.
		Carried forward.....	$15,366,013.80	

(Continued on Next Page)

Ocean Mail Contracts Awarded to American Steamship Lines to Oct. 15, 1932

(*Continued from Preceding Page*)

Route Number	Steamship Cos. & Termini	Class of Vessels Required at Start of Service	Est. Amt. Fiscal Year 1933	Class of Vessels Required. Date of Mail Contract
		Brought forward.....	$15,366,013.80	
36	**Tacoma Oriental Nav. Co.** Portland to Manila and Dairen	Class 6—10 knots—4500 tons	347,679.00	Two reconstructed vessels Class 5; one during fifth year ofcontract and one later; total est. cost $750,000. July 1, 1929.
37	**Panama Mail Steamship Co.** San Francisco to Puerto Colombia	Class 5—13 knots—4500 tons	795,360.00	Two new Class 3 vessels required; a third optional; all contracted for at Federal S.B. Co. Total est. cost $12,750,000. July 1, 1930.
38	**Grace Steamship Company** Tacoma to Valparaiso	Class 6—10 knots—4000 tons	190,800.00	One new Class 3 vessel contracted for at Federal S.B. Co. Est. cost $4,500,000. July 1, 1930.
39	**United Fruit Company** San Francisco to Puerto Armuellas	Class 6—11 knots—3200 tons	935,532.00	Three new vessels of Class 4, Talamanca, Segovia and Chiriqui, contracted for at Newport News S.B. & D.D. Co. Total est. cost $10,637,898. July 1, 1930.
40	**United Fruit Company** New York to Limon	Class 5—13 knots—7200 tons	457,152.00	Three new vessels of Class 4. Antigua, Veragua and Quirigua, contracted for at Bethlehem S.B. Corp.; total est. cost $9,758,947. March 21, 1930.
41	**United Fruit Company** New Orleans to Puerto Colombia (not yet in operation)	Class 6—11 knots—3200 tons	73,725.00	Two new vessels of Class 4 within five years of award. Total est. cost $7,050,000 March 21, 1930.
43	**United States Lines** New York to Hamburg	3 Class 3—18 knots 1 Class 4—16 knots 1 Class 5—14 knots	1,780,172.00	Two new vessels of Class 2; contracted for at New York S.B. Co. Total est. cost $21,900,000. April 24, 1930.
44	**United States Lines** New York to London	Class 5—13 knots—8000 tons	1,053,156.00	Two new vessels Class 3, depending on five-year extension of present five-year contract. Total est. cost $14,500,000. April 24, 1930.
45	**Tampa Interocean SS Co.** Gulf ports to Spain and Portugal	Class 6—10 knots—4000 tons	416,575.00	Two new Class 5 vessels; total est. cost $3,900,000. April 6, 1930.
46	**Roosevelt Steamship Company** Baltimore to Hamburg	Class 4—16 knots—7000 tons	1,272,024.00	Five Class 4 reconstructed vessels (at Federal S.B. Co.); fifth ship completed Nov. 1931; est. total cost $9,145,307. After five years two additional new vessels of Class 3 (conditional). Total est. cost $7,000,000. March 21, 1930
47	**American West African Line** New Orleans to Ports on West African Coast	Class 6—10 knots—4000 tons	87,950.00	Two new Class 5 vessels, (conditional) total est. cost $3,900,000. July 1, 1930.
48	**Oceanic & Oriental Navigation Co.** San Francisco to Dairen, Manchuria	Class 6—10 knots—4000 tons	196,680.00	Two new Class 5 vessels, one within three years and other within seven years; total est. cost $3,000,000. July 1, 1930.
49	**Oceanic & Oriental Navigation Co.** San Francisco to Saigon, Indo-China	Class 6—10 knots—4000 tons	214,680.00	Two new Class 5 vessels, one within five years and other within nine years. Total est. cost $3,000,000. July 1, 1930.
52	**Eastern Steamship Lines** Boston to St. John New York to Yarmouth (Not yet in operation)	Class 2—20 knots—16000 tons	303,160.00	Two new Class 2 vessels; contracted for at Newport News S.B. & D.D. Co. Total est. cost $6,285,298. Feb. 17, 1931.
53	**Black Diamond Steamship Corp.** New York and other North Atlantic ports to Rotterdam and Antwerp	Class 6—10 knots—4000 tons	736,686.00	Five new Class 4 cargo vessels as soon as practicable. Six reconstructed Class 5. Cost $1,067,857. Two new cargo vessels, Class 4, additional (optional). Total est. cost $16,000,000. Oct. 1, 1931.
54	**Mobile Oceanic Line** East Gulf Ports to United Kingdom and other North European ports	Class 6—10 knots—4000 tons	749,100.00	Ten reconstructed vessels Class 5, total est. cost $2,533,000. Two new Class 5 vessels (optional); total est. cost $4,000,000 Additional vessels optional with increase of service. Oct. 1, 1931.
55	**Gulf Pacific Mail Line, Ltd.** Seattle to Tampico, Mex., via Puerto Colombia and Kingston	Class 6—10 knots—4000 tons	145,680.00	Two reconstructed Class 5 vessels, total est. cost $490,000. One new Class 5 vessel, est. cost $1,250,000. One new Class 5 vessel (optional) est. cost $1,250,000. One aditional new vessel (optional), est. cost $1,250,000. Oct. 1. 1931.
56	**Seatrain Lines, Inc.** New Orleans to Havana	Class 5—13 knots—8445 tons	91,504.00	Two Class 5. Cost $3,172,500. Oct. 31, 1931. Service began Oct. 6, 1932.
		Total Annual Payments All Mail Contracts.....	$25,213,628.80	

Key to Classes: Class 6—10 knots—4000 tons; Class 5—13 knots—8000 tons; Class 4—16 knots—10000 tons; Class 3—18 knots—12000 tons; Class 2—20 knots—16,000 tons; Class 1—24 knots—20000 tons.

Officers Are Selected

Officer personnel for the new $8,000,000 Oceanic liner LURLINE, which will begin her maiden voyage at New York Jan. 12 next, has been announced at company headquarters in San Francisco.

Capt. Charles A. Berndtson, former commander of the S. S. MALOLO, will be master of the new vessel, and T. K. Whitelaw, now on the S. S. MONTEREY, will be his chief officer.

The LURLINE is a sistership of the MARIPOSA and MONTEREY, now in service between California and Australia. Her maiden voyage will include the intercoastal trip from New York to California via the Panama canal, and then a sweeping circle tour of the Pacific.

An expenditure of $18,500 was authorized early in October by the lighthouse service for relocating forty range lights on the Houston ship channel between Morgans point and Lynchburg. Removal of lights was necessitated by widening and deepening of the channel by United States engineers to meet requirements of increased commerce. Removal work has been started and the project will be completed within the current year.

Propeller Club Meeting

The Propeller club of the United States in its closing session at Virginia Beach, Va., Oct. 18, unanimously accepted the proposal to hold the club's seven annual convention in Pittsburgh in 1933. Armand J. P. Vandermyn, president of the Port of Pittsburgh club, issued the invitation to meet there next year.

The following officers were re-elected for the ensuing year: Arthur M. Tode, New York, president; John Sonderman, Baltimore, vice president; John A. Erickson, New York, treasurer; and Harold J. Harding, secretary.

World Shipbuilding Totals Show Shrinkage

A SHRINKAGE of more than 200,000 gross tons in the volume of work in the hands of the world's shipbuilders brings the total output of merchant vessels for all countries to new low levels, according to a statement recently issued by Lloyd's Register of Shipping, covering returns for the quarter ended Sept. 30, 1932.

With only 900,000 gross tons of merchant ships under way at present, the world production total has fallen below the million-ton mark for the first time in more than fifty years.

In comparison with the present figure of 901,000 gross tons, the world total for merchant shipbuilding at this time last year was 1,531,000 gross tons, or about 70 per cent more than the current figure. Great Britain and Ireland are constructing only about half as much shipping as they were a year ago, and the same is true of the United States. In the autumn of 1930, however, Great Britain and Ireland were building 900,000 gross tons more than the United States; while at present American shipyards have only 113,000 tons less work than those of Great Britain and Ireland.

Decrease Is World Wide

During the quarter just ended, Great Britain and Ireland and the United States each showed decreases of about 40,000 gross tons, while the other maritime countries, taken as a group, show a decline of 128,000 gross tons. The comparison between the last two quarters, ending Sept. 30 and June 30, is given in the following table in gross tons of vessels under construction:

	Sept. 30, '32	June 30, '32
Great Britain & Ireland	238,433	280,692
United States	124,703	162,203
Other countries	537,931	666,878
World total	901,067	1,109,773

There was not much change during the quarter just ended in the proportion of the world output held by the different groups. The share of Great Britain and Ireland advanced from 25.3 per cent in the June quarter to 26.5 per cent in the September one; while the United States showed a decrease, going from 14.6 per cent to 13.8, and the other countries went from 60.1 per cent to 59.7 per cent.

Contrast between tonnage nearing completion and replacements through new orders is shown in the following table, in gross tons:

	Sept. 30, '32	June 30, '32
New Work		
Great Britain & Ireland	10,837	27,356
Other countries	32,572	42,540
World total	43,409	69,896
Launchings		
Great Britain & Ireland	47,884	68,669
Other countries	140,324	124,071
World total	188,208	192,740

Fewer Tankers Now Building

The returns show a continuance of the decline in the construction of steam and motor tankers of 1000 gross tons each, and upwards. Nearly 60,000 tons less of these types of vessels are being built than at the end of the June quarter. Sweden is leading now in the volume of this construction. A comparison for the last two quarters is given in the following table of gross tonnage:

	Sept. 30, '32	June 30, '32
Sweden	60,200	74,421
Germany	49,600	72,400
Great Britain & Ireland	38,216	47,216
Other countries	67,224	78,832
World total	215,240	272,869

During the quarter just ended the volume of motorships being built throughout the world showed a decrease of 70,000 gross tons; but the volume of other types of vessels fell off 138,000 tons in the same period. At the end of June, about 150,000 tons less of motorized vessels were being constructed than of other types; but at the end of September the gap had lessened to 80,000 tons. At present, motorships represent 45.5 per cent of all construction, a slight increase over their proportion in the June quarter. A comparison for the last two quarters is given in the following gross tonnage table:

	Sept. 30, '32	June 30, '32
Motor vessels	410,044	480,380
Other types	491,023	629,393
World total	901,067	1,109,773

The position of Great Britain and Ireland in relation to motorship construction is in marked contrast with that of other shipbuilding countries. While the latter countries are devoting nearly 60 per cent of their output to motor vessels, only a little more than 10 per cent of the production of the shipyards of Great Britain and Ireland is represented by this type of vessel. The returns show that while Great Britain and Ireland are now building 360,000 tons less of motorships than all other countries combined, these other countries are constructing only about 65,000 tons more of other types of ships than Great Britain and Ireland are. The comparison in gross tonnage production of these groups is shown in the following tables for the last two quarters:

	Great Britain & Ireland	Other Countries
Motor vessels	24,984	385,060
Other types	213,449	277,574
Total	238,433	662,634

Germany Leads in Motorships

Although Germany still retains her lead in the production of motorships, Italy is now hardly a thousand tons behind her. For all other countries combined, there was a decrease during the quarter of 14,000 tons. Figures for the two quarters are given by Lloyd's in this table of gross tons under way:

	Sept. 30, '32	June 30, '32
Germany	79,000	101,300
Italy	77,952	79,050
Sweden	69,150	83,371
Holland	40,149	48,139
Great Britain & Ireland	24,984	34,718
United States	803	803

A decrease was shown during the last quarter for all types of marine engines being built or installed throughout the world.

For oil engines, the returns show that for all countries taken together the total indicated horsepower at the end of September was 355,018, as compared with 409,455 at the end of the June quarter. For the United States, however, there was a gain, the total advancing from 5710 to 8480. For Great Britain and Ireland the total fell, from 22,315 to 13,000; for Germany, from 90,655 to 64,745; for Sweden, from 65,415 to 54,446, and for Italy, from 69,800 to 67,550.

In the case of steam reciprocating engines, the world total of 115,000 indicated horsepower at the end of June fell to 97,336 at the end of the last quarter. Great Britain and Ireland, the chief producers of this type of engine, showed a decrease from 74,024 to 58,476 in this period. The total for the United States at present is only 1000.

Steam turbines showed the greatest decrease during the same period, the world total dropping from 826,150 shaft horsepower to 648,700. The total for Great Britain and Ireland remained about stationary, declining from 216,950 only to 215,400. For the United States there was a decrease from 182,200 to 141,500; and for France from 190,000 to 184,000. Italy had the sharpest decline, her total falling from 237,000 to 101,000.

Little Change in Standing

The relative standing of the various countries in the volume of world shipping production changed very little during the quarter just ended. How the output of the various countries has compared during the past two quarters is shown in the following table of gross tonnage under way.

	Sept. 30, '32	June 30, '32
Great Britain & Ireland	238,433	280,692
Italy	127,969	180,565
United States	124,703	162,203
France	109,285	128,128
Germany	80,770	103,500
Sweden	73,480	89,201
Japan	46,441	43,669
Holland	40,349	48,574

As against nine large merchant vessels, each of 20,000 gross tons, and upwards, being built throughout the world at the end of the June quarter, Lloyd's register now reports only five such. Great Britain and Ireland are still building two; but Italy, which had four under way, now has only one. The United States, which had two building, now has one; and France still has a single vessel.

Completely Welded Lighter Built at Navy Yard

THE freight lighter Y F 221 recently completed at the United States navy yard, New York is of all electric welded construction. There is not a single rivet in the vessel. The length overall is 120 feet, beam, 30 feet, and mean draft in light condition, approximately 5½ feet. She displaces about 270 tons and has a carrying capacity of approximately 250 tons. The mast has a boom which has a capacity of 12½ tons.

The vessel was started in August, 1931, and completed, in so far as was necessary for launching, Sept. 28, 1932. The date of completion of all work and trials has been set as of Oct. 28, 1932.

Order of Welding Members

Most careful attention was paid to the electric welding operations, particularly the order in which they were accomplished during construction, in order to prevent distortion in the various members due to the shrinkage caused by the cooling of the welded metal. During the day shift it was nearly always practicable to have welders tack the members, plates, etc., in their proper places. This was followed by welders working at night for the final securing of the members which were merely tacked in place in the daytime. For the greater part of the overhaul, this was carried out and was the only work on which more than one shift in 24 hours was undertaken.

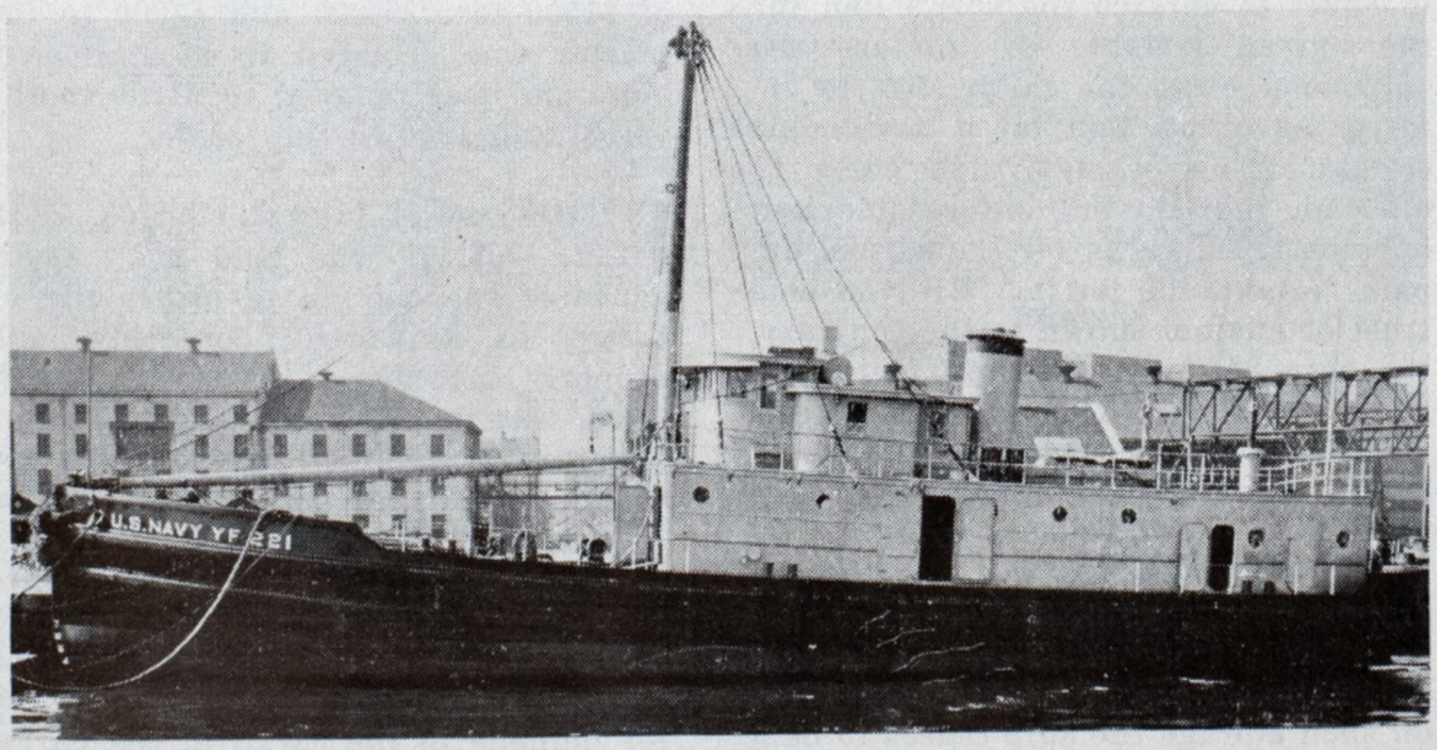
It has also been found necessary to give careful consideration to the order in which the various members are welded because the stresses introduced in the members by the cooling of the welded material may amount to a great deal. Each day the welding which was done the night before was carefully inspected and any welding that appeared to be unsatisfactory was marked so that it could be chipped out and rewelded.

When the vessel was launched, she was practically completed in so far as the installation of the machinery and principal weights were concerned. The hull was completed and tested, the deck house structure was completed, the pilot house and the staterooms just aft of it were installed, the mast and boom, hoisting machinery, and smokestack were in place and secured. The two main engines, which are diesels removed from an old submarine, were installed, but not finally lined up with the shafting, the shafts and propellers were installed as were the rudder and the steering gear.

The vessel was launched stern first with the usual type of launching cradle. This cradle was weighted at the after end so that when the lines securing it to the vessel were cast off, the after end in sinking would enable the vessel to be pulled clear. Immediately after the launching, she was towed to dry dock and the cradle removed in this manner. A very careful inspection was made of the interior of the hull immediately after launching in order to make certain that any jars or stresses would not open up the welding below the waterline. No defects were noted and the vessel did not leak in any weld.

This vessel is the largest all welded vessel that the navy has built. At navy yards, Mare Island, Calif., and Portsmouth, N. H., two all welded, steel garbage Lighters have been built recently, one in each yard. These are slightly smaller than the freight lighter Y F 221 and are of different construction, owing to the fact that the garbage lighters have bins with doors on either side, allowing the dumping of the contents at sea, whereas, the freight lighter has no such arrangement. There is some similarity, however, between these craft in the structural arrangements, which are of the longitudinal type.

It is suggested that perhaps the methods of electric welding developed in the construction of this sizable commercial type of craft will have a marked effect on the application of welding to ship construction. Generally, the methods used divided the work of welding into three separate parts; shell, frames, and longitudinals, and then combining the three as a whole by welding.



United States Navy Freight Lighter YF221. Entirely Welded. Not a Single Rivet Used in the Construction of this Vessel

Requests Bids for Cruiser

The navy department has invited bids for the construction of light cruiser No. 39. It will take three years to build this vessel and it is expected that the successful builder will lay the keel during January next and that the vessel will be completed by the end of 1935.

What additional new construction may be provided for in the budget for the fiscal year beginning June 30 next, is now under consideration before the budget bureau. The navy department is asking for four additional destroyers and for light cruiser No. 40 which may be laid down on Jan. 1, 1934 under the terms of the London navy treaty. Even this program, modest as it is, may not be authorized due to the drastic reduction in all government outlays insisted upon by the President. It is hoped, however, some way can be found to carry through at least this minimum program.

New Lighthouse Tender

A new lighthouse tender, to be known as the WISTARIA, is under construction bp United Dry Docks, Inc., New York, for the bureau of lighthouses, department of commerce. She is the third tender of this type ordered for lighthouse service, the other two being the LINDEN and the COLUMBINE, which were completed last year. The electrical equipment for all three of these vessels is General Electric.

The WISTARIA is of steel construction, approximately 120 feet long with a 25-foot beam, and a draft of 6 feet, 8 inches, and is designed for a speed of 9½ knots. She will be placed in service on the Delaware river.

The power plant will consist of two Winton diesel engines driving two 100 kilowatts, 250-volt, direct current generators at 400 revolutions per minute. These generators will supply electricity for all purposes, including propulsion, lighting, and operation of auxiliaries.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

AN OCEAN carrier is responsible for damage to a passenger's baggage while on a tender, or while being carried from a train to a tender due to its negligence, though a clause in the passenger's ticket purported to relieve the carrier from responsibility for damage occurring before the trunk was placed on the steamer. However, a limitation of liability stipulated in said ticket is applicable to such carrier's liability for damages to baggage before it was put on board.—Federal Insurance Co. v United States, 57 F. (2d) 350.

* * *

MARITIME law has for centuries, in the interests of commerce and as an encouragement to prompt voluntary service to minimize personal and economic loss, recognized claims for compensation to those who rescue property from the peril of the sea. While a forbidden service may not be recognized as a basis of a salvage claim, the right to recover is not dependent upon any expressed invitation or contractual understanding. It is in its nature a voluntary service and need not have been solicited. Removal of motors from a yacht which sank near a wharf after an explosion, taking the motors down, and cleaning out and reassembling them, was a salvage service, it was declared in the case of MIST-CHIEF, 57 F. (2d) 875, and recovery therefor was allowed.

* * *

A COMPANY having custody of a steamship for general repairs was obligated to make repairs occasioned by its striking against a pier during towage between piers by tugs employed by the company. Such company, crediting the owner with the amount demanded as liquidated damages for delay in delivering the vessel and negotiating a check for the contract price, less such credit, without reservation, could not recover the amount from the owner. The shipowner, claiming liquidated damages for such delay in delivering the ship, must prove loss of profits between the contract date for and actual delivery thereof with reasonable certainty.—WILLIAM ROCKEFELLER, 57 F. (2d) 897.

* * *

LEAVING a barge unattended at a dock in the face of storm warnings given an hour before the master left and at least eight hours before the injury, was negligence on the part of the master and of the owners.—SADIE, 57 F. (2d) 908.

* * *

SHIPPERS are not entitled to the latest design; ships, well built in their time, may still carry cargo unless they become so clearly out of fashion as to be an anachronism. The shipper bargains for no more than usual carriage.—Spang Chalfant & Co., Inc., v Dimon Steamship Corp., 57 F. (2d) 965.

* * *

A CARRIER is bound to exercise only ordinary care while in possession of cargo after its discharge on a pier, where the bill of lading provides for termination of the carrier's responsibility immediately on delivery of the goods from the steamer's tackle.—BELLINGHAM, 57 F. (2d) 1015.

* * *

A TUG which saw a vessel at a draw bridge, but failed to hold back and in emergency brought her tow against an abutment, was solely at fault.— P. R. R. No. 35, 58 F. (2d) 170.

* * *

THE shipper of goods does not bind them to the ship for wages of the seamen, but for the agreed freight, out of which the ship should pay wages. Except when salvage is involved the seamen look to the ship and to the freight only. But if the freight is not paid, since the ship has a lien on the cargo therefor the seamen are allowed in effect to enforce the ship's lien for the agreed freight; or in case the shipowner owns the cargo also, to enforce the ship's lien for a reasonable freight. The seamen thus come to have an indirect but enforceable lien on each lot of cargo for the earned unpaid freight due on it. With no contract or custom shown to the contrary, the ship before demanding freight is bound to bring the goods to destination, and to deliver them on the wharf so as to allow examination, and to notify the consignees or owners. If they cannot be notified, or if the freight is not paid, the goods should be stored safely until freight is paid and delivery can be accomplished. Upon such storage the ship ceases to be a carrier, but has earned her freight and retains her lien therefor. Pending notice and delivery it was not conversion of the cargo by the ship, but rather a discharge of duty to put it in proper storage for its safety, and the freight was not thereby forfeited. Seizure of the ship and cargo under in rem libels, after cargo was stored, did not destroy the ship's right to freight where no liens on the cargo beyond freight and storage existed.—Clifford v. Merritt-Chapman & Scott Corp., 57 F. (2d) 1021.

* * *

UNDER the rule that a carrier must furnish a vessel that is seaworthy and suitable for the service on which employed, a latent defect is no excuse.—American Agricultural Chemical Co. v. Brooklyn & Buffalo Navigation Co., 56 F. (2d) 271.

* * *

A TUG with tow, tailing another tow, and traveling faster, was an overtaking vessel, and she could not avoid the duties of that relation by doing in advance what she would ultimately have to do if she did overtake the tow ahead and intended to pass, namely, turning to starboard in a parallel or nearly parallel course.—HAROLD L., 56 F. (2d) 609.

* * *

SALVAGE service is a service which contributes immediately to the preservation and rescue of property in peril at sea. Simply pulling on a vessel a considerable time before favorable tide and swell coincided with floating is not enough to establish a claim for salvage services, it was held in the case of Grosvold v. Booth Fisheries Co., 56 F. (2d) 649. An award of $1500 to a vessel and $1000 to the master was declared to be unreasonable, and was reduced to $1200 to the vessel and $300 to the master.

* * *

IN THE case of JOHN J. GRIMES, 57 F. (2d) 321, it was held that negligence of the captain of either tug or barge, in seaworthy condition, and properly manned, equipped, and supplied, was an error of navigation constituting a complete defense by the tug to a claim for damage to cargo on the barge striking the miter-sill of a lock when water was released; also held that contention that tug and barge were not seaworthy came too late after trial of suit against the tug for damage to the cargo in the barge, in absence of cross-examination tending to show such fact.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	258	1,634,448	266	1,658,521
August	287	1,754,583	270	1,636,803
July	238	1,483,476	254	1,553,215
June	267	1,579,970	277	1,650,915
May	277	1,484,116	259	1,392,451
April	270	1,506,696	277	1,515,147
March	332	1,982,670	375	2,070,546
February	312	1,875,981	322	1,776,394
January	297	1,821,335	305	1,719,978
December, 1931....	314	1,692,258	343	1,744,190

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	45	123,049	36	99,766
August	64	175,530	43	113,901
July	49	130,439	38	85,956
June	55	157,399	36	102,354
May	66	205,184	46	142,889
April	55	165,646	51	159,427
March	57	186,479	45	151,190
February	49	150,899	34	98,667
January	51	168,266	36	114,982
December, 1931....	58	180,172	42	132,734

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	114	337,608	91	283,227
August	117	369,799	103	339,775
July	121	408,896	101	346,926
June	116	342,057	95	322,558
May	125	294,093	97	257,608
April	103	308,951	72	215,237
March	99	319,863	65	217,992
February	107	315,036	63	213,166
January	94	286,508	61	208,491
December, 1931....	102	313,977	65	240,908

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	9	14,698	9	16,526
August	14	25,844	14	24,208
July	9	15,156	10	17,733
June	10	25,895	11	26,519
May	14	26,484	14	29,669
April	10	22,911	10	24,483
March	14	41,083	13	35,993
February	20	53,793	20	56,558
January	13	28,179	14	28,955
December, 1931....	18	38,860	18	37,319

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	3	11,450	4	14,471
August	5	13,418	1	5,071
July	2	5,918	2	9,634
June	7	22,359	3	7,151
May	7	24,204	....	.....
April	4	17,438	3	13,515
March	8	35,293	5	24,289
February	5	19,442	4	18,533
January	8	41,147	4	21,654
December, 1931....	11	41,268	4	17,037

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	25	98,370	37	146,945
August	22	93,256	32	127,572
July	21	84,961	24	99,035
June	20	80,272	25	98,356
May	20	82,750	25	99,862
April	23	83,171	28	104,796
March	26	103,924	36	142,050
February	32	127,810	36	149,417
January	27	112,542	42	168,762
December, 1931....	29	114,184	40	154,060

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	66	190,459	80	241,287
August	88	243,077	87	245,091
July	88	255,354	86	255,209
June	95	299,502	97	294,264
May	95	289,042	102	317,751
April	108	346,276	114	377,317
March	96	288,052	105	319,511
February	105	337,487	98	323,603
January	95	301,958	102	328,876
December	102	330,709	106	354,320
December, 1931....	102	330,709	106	354,320

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	26	74,483	53	118,437
August	25	53,025	37	86,952
July	23	72,755	36	91,332
June	18	51,803	48	114,222
May	24	52,049	43	112,672
April	22	59,932	33	77,515
March	33	79,948	42	99,939
February	22	68,136	48	121,647
January	17	53,536	38	104,392
December, 1931....	30	95,762	38	110,614

Jacksonville

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	7	15,879	7	12,539
August	8	14,142	9	16,647
July	8	20,558	7	16,963
June	7	12,746	10	20,277
May	12	33,157	8	20,489
April	9	17,886	9	21,812
March	8	15,560	13	26,457
February	8	18,785	10	21,812
January	8	26,601	12	27,759
December, 1931....	12	25,453	10	21,501

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	36	60,309	36	61,405
August	37	66,432	37	66,313
July	38	62,503	40	62,486
June	37	61,115	39	76,274
May	56	76,236	55	76,070
April	55	77,443	50	80,778
March	41	61,078	39	59,069
February	39	59,334	39	66,392
January	43	67,913	42	71,873
December, 1931....	39	68,392	40	73,365

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	89	166,896	96	193,213
August	90	196,453	88	188,375
July	107	222,810	99	203,444
June	91	207,178	93	201,443
May	102	212,215	97	198,871
April	102	192,617	104	202,965
March	97	204,645	98	211,921
February	101	235,846	96	219,215
January	110	253,792	112	242,378
December, 1931....	98	226,656	85	214,395

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	40	168,740	40	175,635
August	39	183,141	36	167,807
July	32	145,560	36	162,923
June	36	160,585	32	143,574
May	43	184,393	41	170,652
April	40	171,346	43	191,352
March	43	190,082	43	180,862
February	50	217,837	54	232,138
January	48	200,281	50	216,819
December, 1931....	50	218,018	48	204,111

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	151	423,791	139	415,704
August	160	448,826	156	442,655
July	166	438,496	171	448,198
June	170	597,552	164	457,960
May	182	517,523	169	472,154
April	192	558,631	194	559,824
March	200	604,269	196	589,805
February	157	436,882	169	469,296
January	171	516,707	171	506,411
December, 1931....	169	482,802	170	504,981

Charleston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	21	54,638	20	52,035
August	15	29,293	18	46,756
July	17	39,628	14	39,844
June	26	80,438	25	78,864
May	29	80,415	27	71,288
April	21	53,404	21	57,341
March	37	131,723	36	110,353
February	32	88,616	27	75,262
January	24	73,488	22	16,217
December, 1931....	37	108,083	35	96,490

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..				
August	29	44,389	71	202,598
July	27	50,302	79	220,489
June	28	47,046	81	226,542
May	38	84,468	86	259,026
April	44	97,609	106	297,282
March	32	61,079	109	319,013
February	27	64,866	101	317,095
January	26	73,215	92	292,274
December, 1931....	37	113,327	111	358,950

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	223	581,402	222	610,443
August	253	653,836	244	635,164
July	226	646,417	230	617,947
June	168	588,184	162	558,945
May	229	691,109	164	650,539
April	189	617,325	222	635,301
March	168	622,067	188	611,770
February	164	627,876	158	622,730
January	144	578,699	149	594,384
December, 1931....	153	517,165	136	506,985

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	136	608,268	153	667,866
August	152	640,952	162	702,483
July	148	687,695	142	655,436
June	133	588,465	132	590,158
May	154	669,735	152	649,509
April	146	663,647	144	613,085
March	139	645,331	162	709,778
February	149	638,222	144	583,030
January	145	635,218	147	646,987
December, 1931....	155	649,915	122	579,608

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1932..	23	103,424	33	121,134
August	11	47,148	32	116,860
July	17	66,968	20	87,589
June	20	93,807	31	119,752
May	29	122,192	36	149,039
April	31	131,585	39	155,861
March	27	113,624	43	167,956
February	25	103,589	43	162,236
January	25	108,322	36	145,084
December, 1931....	26	99,354	42	148,568

Note: The figures given in this table are for direct entrances and clearances. Additional vessels in foreign trade enter and clear from and to other American ports after original entry and before final departure. At the port of Philadelphia, for instance, additional vessels in the foreign trade in this category were 51 of 174,153 net tons entered and 51 of 173,046 net tons cleared for the month of September.

Latest Data on New Marine Work

Information on New Ships Ordered—Building and Repair Contracts Let—Shipping Board Loans Made, Authorized or Pending

THE SANTA LUCIA, third of the four new $5,000,000 Grace liners, was successfully launched at the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., at 10:30 a. m., Oct. 3. Miss Hilda Holloway, 12-year old daughter of William Grace Holloway, vice president of W. R. Grace & Co., christened the new vessel as official sponsor.

Myron C. Taylor, chairman of the board of directors of the United States Steel Corp., owner of the shipyard, made the principal address. He said in part, "This ship fostered by recently awakened but forward-looking governmental policy will ply between the ports of North America and those of our sister group of states to the south; she will cement new ties with our neighbors; she will render service to humanity in bringing together those who have been separated by distance and time, and will maintain and expand those trade relations between distant peoples which have ever been the source of welfare and prosperity.

"But this is more than a ship, which today we are called upon to christen. She represents the inspiration of a courageous and far-seeing man and his associates. She symbolizes faith in time of serious depression, and furnishes an example to certain members of the community who have been so depressed with doubt and uncertainty that they have feared to venture their ample funds, and by their action have helped a slowing down of the circulation of the lifeblood of industry. The building of these great ships by the Grace line should stimulate renewed action, as the project has bred occupation and compensation, and is a contribution to the well-being of all the community."

Now that the SANTA LUCIA is launched, the only one of the four sister ships left on the ways is the SANTA ELENA. The SANTA ROSA, the first of the quartette, was launched March 24, and recently completed her sea trials. The SANTA PAULA was launched on June 11.

These new and magnificent Grace liners, alike in detail are 508 feet in length, 72 feet in beam, and have a displacement of about 17,000 tons. The speed is 20 knots. Each vessel is equipped with General Electric turbine geared main propelling units. Electric motors and controls for both deck and under deck auxiliaries are also of General Electric make. They have a large cargo capacity arranged to facilitate rapid and easy handling of freight by means of new and specially designed winches. They also have a carefully planned refrigerated space for perishable cargo.

The new liners are the first American ships having all outside staterooms with private baths. The public rooms are arranged with large windows for natural ventilation and light, and have, in addition, an elaborate mechanical system.

Among the new features introduced is the location of the dining rooms and the galleys. The dining room opens from the promenade deck and is two decks high with roll-back dome and tall casement windows so that the passenger is really dining in an outdoor-cafe-like atmosphere. The galleys are situated aft on the boat deck.

Sea Trials, Santa Rosa Are Successfully Completed

A speed of 20.05 knots was attained by the new Grace liner, SANTA ROSA, Oct. 11 when she had her official speed trials off Rockland, Me. The SANTA ROSA left the yard of her builder, the Federal Shipbuilding & Dry Dock Co., Kearny, N. J., on Oct. 8, and returned to New York on Oct. 13 after her successful trials on the way to and from and at Rockland.

Reference has been made to the entire program of four new Grace liners in an accompanying item on the launching of the SANTA LUCIA. The SANTA ROSA is the first of the four ships to be completed. She is equipped with General Electric turbine geared propelling machinery, and is completely electrified throughout by the same company.

She is a twin screw vessel and according to an official message after her trials, guaranteed horsepower, revolutions and speed, were readily met. A speed of 20.05 knots was made at 14,350 horsepower, with turbines throttled. It is believed that the ship can safely develop close to 21 knots when developing 16,000 horsepower.

The SANTA ROSA will open a new fast passenger, mail and freight service between the east and west coasts of the United States via the Panama canal, with additional stops at Havana, Cartagena, Acapulco and other Central American ports. She is scheduled to sail from New York on her maiden voyage Nov. 26. Passenger capacity is 222 first class and 64 others. Her tankage capacity is 374,222 gallons, and bunkerage capacity is 725,000 gallons, giving her a cruising radius of 16,000 nautical miles. She was officially numbered Oct 10; her gross tonnage 11,200.

U. S. Engineers Ask Bids

During October the United States Engineers office, Kansas City, Mo., asked bids for the construction and the delivery afloat ready for service, of one, two or three 40 feet x 8 feet x 8 feet 8 inches steel launches. Bids were to be in Oct. 7. No announcement of award made up to the time this is written.

The United States Engineers office, 333 North Michigan avenue, Chicago, on Oct. 17, issued a request for bids on construction of three oil barges and their delivery afloat at the Lockport lock or at the Starved Rock lock on the Illinois waterway. The bids are to be opened on Nov. 16. Full information will be furnished prospective bidders by application to the United States Engineers office in Chicago.

To Build New Tender

Bids for the construction of a new lighthouse tender for service upon the coast of Alaska will be opened in the office of the commissioner of lighthouses on Nov. 29, at the department of commerce, Washington.

This new vessel will be a twin screw steam propelled vessel, with steel hull, 173 feet in length, and engines of 1000 horsepower. The name selected for the new ship is the HEMLOCK, and it will replace the tender FERN, a small wooden vessel not now suitable for work upon the coast of Alaska.

The HEMLOCK will be a sister ship to the tender ARBUTUS now under construction, with minor modifications suiting her to more severe weather conditions to be encountered in Alaska.

A new report has been published on the ports of Olympia and Port Angeles, Wash. This report is one of a series covering the principal ports of the United States, prepared and published by the bureau of marine development, United States shipping board, and the board of engineers for rivers and harbors, war department.

Private Shipyards Need Naval Construction

It is of vital importance to the private shipbuilding companies of the United States that they be given a share in any new work the navy department may place. A suggestion has been proposed by H. Gerrish Smith, president of the National Council of American Shipbuilders that private shipbuilding companies, in order to keep going and to give employment to thousands of workers, would be willing to aid in financing construction of three additional United States destroyers to the end of the government's fiscal year if that is necessary.

Six destroyers authorized by congress were not placed for reasons of economy when it was expected they would be almost a year ago. On Sept. 27, however, contracts were placed for the first three of these vessels with the navy yards at New York, Philadelphia and Boston, each yard receiving one vessel. It is with reference to the remaining three that Mr. Smith is making his proposal of shipyard aid in financing until the funds are available in the next fiscal year. Mr. Smith said in part:

"To be consistent in its policy to relieve unemployment the navy department should proceed immediately with awarding the construction of the three remaining destroyers to private shipyards.

"The construction of three destroyers over a period of 27 months would provide work in private shipyards and plants of allied marine industries for about 400 men at the end of three months reaching a maximum of 3500 men in 21 months and continuing at approximately this number until delivery of the vessels.

"The private shipbuilding industry is facing a serious depression. All except four of the contracts for sea going vessels now under construction will be completed by the end of this year, and the remaining four early in 1933, and as a result workmen are being discharged in large numbers. There are no contracts for the construction of merchant vessels in sight to take the place of those that will be completed and serious unemployment and disorganization of working forces in the private shipbuilding industry are inevitable.

"The national council is informed that the private shipyards would be willing to finance the construction of these destroyers to the end of the government's fiscal year if such action be necessary to permit the immediate commencement of their construction."

Accept Scrapping Bids

The shipping board on Oct. 7 accepted the bid submitted by the Boston Iron & Metal Co., Baltimore, for the scrapping of 124 vessels, which the board had previously advertised, and upon which bids were received on Sept. 30. The accepted bid was on the proposition offered of a price of $1.51 per gross ton of recoverable material. The contract to be executed by the parties will be submitted to the board for approval prior to execution, and will include the provision that the right is reserved to withdraw such of the vessels bid for as the board may elect, with the privilege at the discretion of the board of substituting other vessels for vessels which may be withdrawn.

It is anticipated that the work involved will insure employment for about 600 men for a period of approximately three years. This plan marks a forward step in the efforts of the board to further reduce the idle tonnage over-hanging the American shipping situation. The idle vessels in the hands of the shipping board will be reduced from 265 to 141. In addition, the board has 100 vessels in active operation spread among the five lines in the hands of managing operators under the lump sum agreement.

The Bath Iron Works Corp., Bath, Me., on Oct. 12, launched a 60-foot steel vessel, the T. B. McClintic, which is to be used by the Public Health service in Boston harbor.

Rex, Italian Superliner Arrives in New York

Italy's pride, the Rex, new flagship of the Italian line, and the largest ship ever built in Italy, arrived in New York on Oct. 7 on her maiden voyage from Genoa. She carried 1361 passengers. The Rex is of 51,000 tons and is credited with a maximum speed of 27 knots. Due to a breakdown of the electric generating plant, she had been delayed at Gibraltar for almost three days, but on the remainder of her voyage she made good time.

Accommodations are provided for 2000 passengers in four classes; first, special, tourist and third. Her length is 880 feet and her beam 102 feet. The propelling power is arranged in four geared turbine sets, each connected to a propeller and giving a total horsepower of 125,000. At a sea speed of 27 knots, the Rex will make the run between New York and Italy in 6½ days, and she will make Gibraltar in less than five days.

The new lighthouse tender Myrtle, which will be used in the construction and servicing of aids to navigation along the Gulf coast was launched at Dubuque, Iowa, Sept. 30. Within a few months this new boat will be completed, and will proceed down the Mississippi river to take up her duties.

Launch Suction Dredge

The Sainte Genevieve, second of three large dustpan type, suction dredges, constructed for the United States Engineers, St. Louis, was launched during October by the Dravo Contracting Co., Pittsburgh. The dredge is 200 feet long, between perpendiculars 47 feet 10 inches beam, and 8 feet in molded depth. An article in the October issue of Marine Review gives an illustrated description of the first of the three dredges, the Dundee, now in service.

The third suction dredge, the Grafton, was launched Oct. 22.

Bunker Prices

At New York

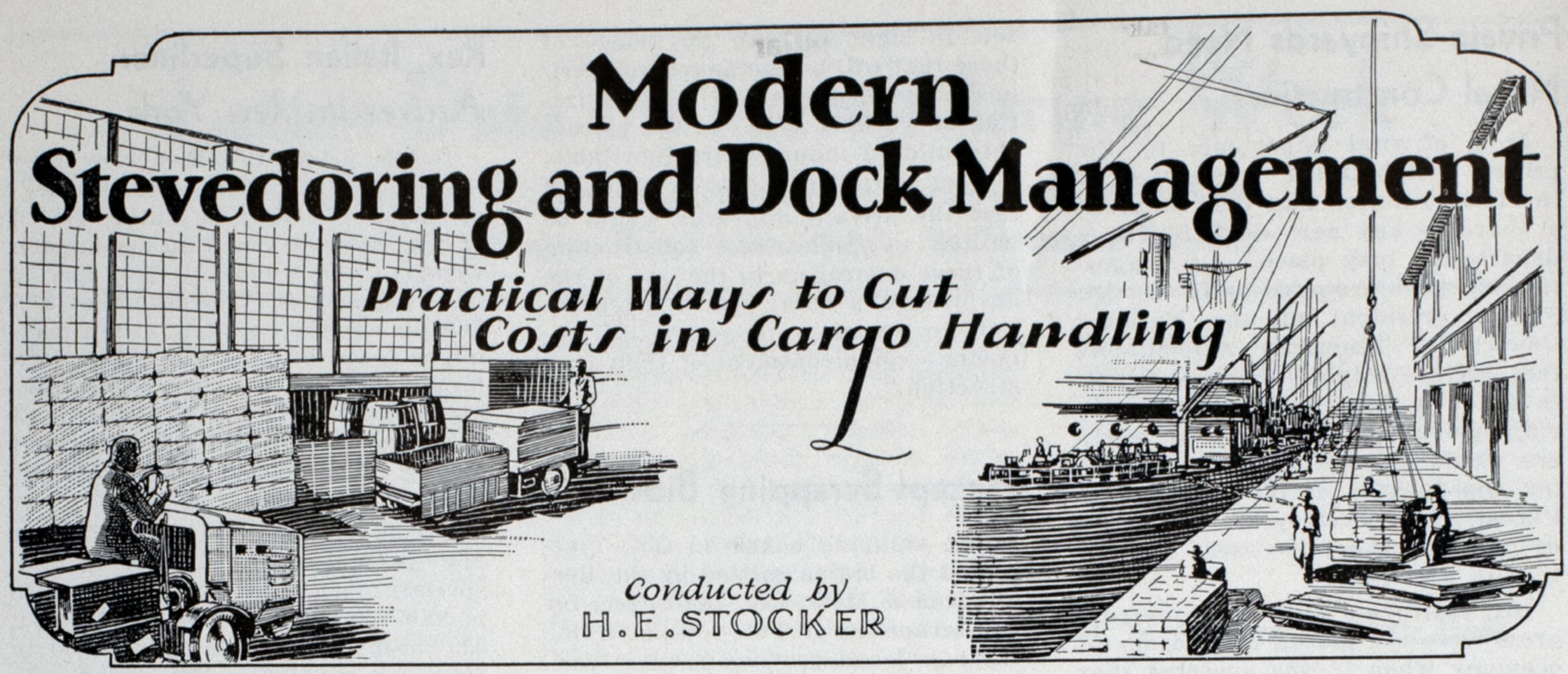
	Coal alongside per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Oct. 18, 1932	4.50@5.00	.80	4 08
Sept. 18,	4.50@5.00	.80	4.08
Aug. 18,	4.50@5.00	.90	4.08
July 18,	4.50@5.00	.90	4.04½
June 18,	4.50@5.00	.80	3.70
May 18,	4.50@5.00	.75	3.70
April 18,	4.50@5.00	.70	....
Mar. 18,	4.50@5.00	.65	3.25
Feb. 18	4.50@5.00	.65	3.25
Jan. 18	4.50@5.00	.65	3.25
Dec. 18	4.50@5.00	.65	3.25

At Philadelphia

	Coal trim in bunk per ton	Fuel oil alongside per barrel	Diesel engine oil alongside per gallon
Oct. 18, 1932.	4.50@5.00	.80	4.04
Sept. 18,	4 50@5 00	.80	4 04
Aug. 18,	4 50@5.00	.90	4.04
July 18,	4.50@5.00	.90	4 08
June 18	4.50@5.00	.80	3 69
May 18,	4.50@5.00	.80	3.69
April 18,	4.50@5.00	.75	3 21
Mar. 18,	4.50@5.00	.65	3.21
Feb. 18	4.50@5.00	.75	3.45
Jan. 18	4.50@5.00	.75	3.45
Dec. 18	4.50@5.00	.75	3.45

Other Ports

Oct. 18, 1932	
Boston, coal, per ton..	$——
Boston, oil, f. a. s., per barrel	$0.83
Hampton Roads, coal, per ton, f.o.b., piers	$4.25
Cardiff, coal, per ton	13s 3d
London, coal, per ton	—s —d
Antwerp, coal, per ton	—s —d
Antwerp, Fuel oil, per ton	67s 6d
Antwerp, Diesel oil, per ton	82s 6d
British ports, Fuel oil	67s 6d
British ports, Diesel oil	82s 6d



How Mechanical Equipment Is Used to the Greatest Advantage

By H. E. Stocker

THE same principles of transportation that apply to ship operation apply to the miniature transportation operation on a terminal using tractors and trailers. Economy depends upon the size of the transporting unit, the speed with which it is moved, and the time that the units are tied up at terminals.

Speed of movement can be obtained only by use of mechanical power. One or two men pushing a loaded trailer by hand will make approximately 150 feet a minute, while the same trailer may be hauled by an electric or a gasoline tractor at a speed of 500 or more feet a minute.

It is important, however, not to overlook the fact that the total elapsed time is the fact which determines the real economy of the operation.

Where Man Power Fails

Congestion on a terminal may make it impossible to haul at more than man power speed. However, mechanical speed may be the more economical, because less time is taken to start the loaded trailer moving, as well as the ability of the tractor to keep a load moving with a minimum of man power expense. One man with a tractor may haul several tons at 15 miles an hour. A small army of men would be required to duplicate this performance in terms of tons moved an hour.

On one terminal eight men were seen struggling to start a trailer moving. The trailer was loaded with 3000 pounds of pig tin. One man with a small three wheel tractor could have moved this load without delay. The less delay of this character, the less congestion, which is itself an important result of the use of mechanical equipment on many terminals. Although the depression has caused a decrease in volume of cargo, some transportation companies have reduced terminal space. Congestion exists even now.

One frequent question relative to tractor trailer operation is the economical haul for this type of equipment. Frequently it is stated that tractors and trailers are economical only for hauls 300 feet and over. The inaccuracy of this statement is refuted by the actual economical operation of tractors and trailers on many terminals for shorter distances. This class of equipment is frequently used profitably where hauls range from 25 to 300 feet. Where the distance is short, the principal economy is the speed with which the trailer is started in motion.

Movement of small packages of freight short distances across a terminal by tractor and trailers has proved more economical than moving the small freight with a two wheel hand truck. The load unit is larger and this larger unit is moved without undue effort and delay. Hand trucks are used only for handling large and heavy cases, and other freight, which can be taken from the floor of the terminal transported, and dropped to the floor again with less effort than required to lift on to a trailer and handled from trailer to floor at the destination point. Part of this may be offset by allowing the load to remain on the trailer. Furthermore, heavy and bulky pieces of freight may be loaded on to a trailer with less effort than lifting from the floor, by building a short portable ramp, up which a hand truck may be pushed.

Long Hauls at Less Cost

Long hauls by tractors and trailers are economical as compared with hand trucks. Freight can be received at the bulkhead platform at the head of a pier, thus reducing congestion on the pier and expediting the movement of shipper's trucks. The haul from the bulkhead to the outer end of the pier, regardless of its length, is economical when tractors and trailers are used. A similar haul of 800 to 1500 feet with hand trucks would be ruinous.

The profitableness of tractor trailer operation may be increased by reducing terminal time of trailers. This is done by expediting the loading and unloading of trailers. Instead of loading 50 cases, one by one, on to a trailer, and then unloading 50 cases, one by one, to the floor of the terminal at another point 50 to 100 feet distant, the cases are placed on skids. The skids then become the unit of handling instead of the cases

—250 pounds as compared with 50 pounds. This heavier unit is lifted to and from the trailer by a high lift truck or crane. The cargo handling operation at the Cristobal docks is an example of this character of tractor trailer operation. Here electric high lift trucks are used to handle the skids.

On Using Crane Trucks

The loading and unloading of trailers is expedited on some terminals by cranes. An electric crane truck may be used to lift rolls of newsprint paper from a trailer and pile them on the pier. These trailers may be loaded at ship side with the ship's gear.

Use of cranes for lifting cargo from, and piling above, man high, is profitable when there is sufficient space to use cranes. If bags of rice are divided into small lots on a congested terminal, cranes cannot be used successfully.

When bales of cotton and wood pulp are to be moved short distances, the chisel trucks and the crane trucks have proved more effective than trailers. The chisel can quickly be driven under the load or the crane hook attached and the load raised, carried, and dropped, with less time and effort than if it were necessary to place the load on a trailer.

Where the investment in a chisel or crane truck is not justified by the amount of cargo to be handled, this work can be done better with a two wheel hand truck. In this case, the economical haul is less than for a chisel truck.

The need for the hand truck on terminals using tractors and trailers is exaggerated.

One large rail and marine terminal with an unusually good management has practically eliminated the use of two wheel hand trucks. The work of the terminal is handled by gasoline tractors and trailers. Cargo is discharged on trailers through sideports. The trailers are made up into trailer trains on the pier for hauling to outgoing freight cars, or for hauling to warehouses 1500 feet distant.

Sling Trailers Overside

Slinging trailers overside has extended the usefulness of tractors and trailers by facilitating the movement of cargo from and to the square of the hatch and expediting the movement of the hook. When a trailer is hoisted over side, instead of a platform or other type sling, the sling load need not be swung to land it near as possible to place of stowage. Not only is the operation speeded, but cargo is damaged less. Also, when discharging, the sling load is on wheels the instant it lands, and is ready to be moved. A platform sling must be steadied to land properly on a trailer or truck, a time consuming operation.

Economical tractor trailer operation depends upon the use of well designed equipment. Trailers should be a size suitable for the conditions on the terminal. The standard 3 x 6 feet trailer is found in use under a wide variety of conditions, not only in cargo handling, but in railroad freight stations and in industrial work. The 3 x 6 size has proved an excellent compromise between the large trailer with large carrying capacity and the trailer which is small enough to maneuver easily in congested quarters.

A well designed trailer is fitted with new type rubber tires which reduces the effort necessary to move a trailer, also with automatic couplers of improved design. Automatic couplers expedite the movement of cargo by facilitating coupling and uncoupling. The saving for each coupling may be very small, but in the aggregate of thousands of couplings and uncouplings, it is a saving worth the small additional investment for automatic couplers. The Eastern Steamship Co. thought so much of the advantage of automatic couplers that it recently had its old trailers fitted with new couplers.

Automatic Couplers Save Time

An example of the effective use of automatic couplers was observed recently at a terminal at Newport News, Va. A tractor was coupled to four loaded trailers. Another train of four loaded trailers was brought to a point near the end of the first train where the tractor driver uncoupled the coupler while the train was moving and pulled aside. An assistant guided the head trailer to the rear trailer of the first train. When the couplers locked automatically the first tractor driver got under way with the train of eight trailers.

A steamship line recently cut cargo handling costs over 12 per cent by substituting tractors and trailers for fifth wheel trucks moved by hand power only. The credit for the improvement was not due entirely to the better equipment. The modern equipment was used intelligently by a well trained organization, an essential requirement in the economical management of any cargo handling operation. However, a good organization will do a better job when using well designed caster type trailers and tractors than when using fifth wheel hand trucks without tractors.

The length of a trailer train must depend on conditions encountered. The real test of efficiency is the amount of cargo handled within a given period of time. This amount of cargo is determined by the train load multiplied by the number of trips made. Therefore, under some conditions a shortening of the train will increase the tonnage efficiency by permitting more rapid handling of the train. When the floor is rough, handling a long train of trailers will mean that more stops will be required to pick up the greater amount of freight which will be jarred off. Moving in and out trucks and cargo is also easier with a short trailer train.

Limiting Length, Trailer Trains

When a tractor trailer train goes into a ship through a side port, a long train would be impossible because of the restricted space for maneuvering within the ship. This would necessarily restrict the effective length of trailer train used on the terminal.

On the terminal of the Chicago and Northwestern Railway Co. at Proviso, Ill., loaded trailer trains of 25 trailers are handled by three wheel gasoline tractors. Empty trailers are hauled in trains of even greater number. This is a large terminal without the congested conditions often met with on a pier.

The selection of the type of tractor is important. Although the mechanical features are important, the efficiency of the tractor as a cargo handling tool is of far greater importance, for that is the purpose for which a tractor is purchased. Provided a tractor is not mechanically deficient in the extreme, the chief mechanical point is the freedom from breakdowns, not because of the direct expense entailed, but rather because of the disruption of the cargo handling operation with consequent delaying of gangs, checkers and delay to shippers and consignee's trucks. This in turn ultimately results in loss of business.

Some lines using tractors and trailers, could increase the economies resulting from a thoroughly effective tractor trailer operation by acquiring additional trailers. This is not always easy to prove to the executive who is responsible for the purchase of the equipment, with the result that the man in charge of the actual cargo handling operations is prevented from acquiring the additional equipment. The best way to justify or test the judgment of the men in charge of cargo handling is to make a thorough analytical time study of the operations and develop facts which will convince any reasonable level headed executive that the additional trailers will pay for themselves within one or two years.

Segregating Diversified Cargo

Often the use of mechanical equipment is said to be impractical where many marks must be segregated in discharging cargo. However, the operation of many terminals disproves this contention.

The Pinners Point Marine terminal of the Southern Railway Co. at Norfolk, Va., has as difficult a problem as any terminal in separating numer-

(*Continued on Page* 50)

British Shipping Baffled by Trade Decline

At a meeting of the council of the chamber of shipping of the United Kingdom held in London Oct. 6, the question of rationalisation of the industry was considered. It was reported that a voluntary laying up scheme prepared by a special committee had been submitted to owners throughout the country, but that from replies received it was clear that this particular scheme would not command a sufficient measure of support. It was, however, decided by a majority to explore the possibility of scrapping.

The council also received a verbal report of discussions by the shipping policy committee in regard to the serious position which has arisen from the continued decline in world trade and the growth of foreign subsidies to shipping. They endorsed the committee's recommendation that the industry should place before the government the increasing gravity of the position and the need for a serious attempt at the forthcoming world economic conference on the one hand to remove trade barriers and restore the volume of cargoes in the world's overseas trade.

Failing that the council felt that the whole position as regards counter measures to safeguard the interests of British shipping might well have to be reconsidered. British shipowners have always believed and have long fought for the principle of equality of treatment of shipping but they cannot indefinitely stand idly by and watch their trade destroyed if other countries are not prepared to grant that equality which is given them by this country. Failure to secure agreement at the world economic conference must inevitably force on the United Kingdom consideration of methods of counter action to the dumping of subsidised shipping services.

Sailors Fund Committee

The joint emergency committee of seamen's welfare agencies in the port of New York has announced through its chairman, Charles S. Haight, that it has been decided to continue the program of relief which was begun last winter and that the committee would undertake to raise $150,000 to avert suffering and want among the unemployed sailors during the critical winter which is ahead.

The committee, which is comprised of prominent marine and steamship officials, will distribute the funds raised among various seamen's welfare agencies which are prepared to lodge and feed merchant seamen at a rate of sixty cents per man per day. Last winter the committee, through the generosity of steamship interests, employed seamen, the United States navy Athletic association and individual citizens, raised $105,701.97 and with this money provided meals and beds for 7475 destitute seamen between October, 1931 and June, 1932. About 1000 men were cared for daily during this eight months' period, and after June about 200 destitute seamen were cared for daily until the money was exhausted. The committee expects to feed about 1500 seamen daily this fall and winter if the necessary funds can be raised.

Liner Named Normandie

Word has been received that officials of the French line have decided to name the superliner now under construction at St. Nazaire and which is to be launched Oct. 29, the NORMANDIE. So far this vessel, which will be the largest and fastest merchant vessel ever built, has been known as the "T-6." The new vessel it was expected will be about 73,000 tons and 1020 feet in length overall. Her speed is estimated at 30 knots. For some time the name chosen was that of the late martyred president, Doumer. It is understood that the idea of so honoring the late president was abandoned at the request of his widow. The NORMANDIE is scheduled to enter service sailing from Havre early in 1934.

Vessel Construction

Seventeen steam and motor vessels of 16,353 gross tons were built in the United States and officially numbered in the two weeks ended Oct. 1, according to Arthur J. Tyrer, assistant director of the commerce department's bureau of navigation and steamboat inspection. During the two prior weeks, 33 vessels of 1123 gross tons were added and for the corresponding period in 1931, 28 vessels of 4952 gross tons were awarded official numbers.

Of the vessels numbered during the latter part of October, 14 vessels of 182 gross tons were of wood construction and 3 vessels of 16,171 gross tons were of steel. Total construction for the period was classified as follows: Steam, two vesels of 16,122 gross tons; motor (oil), one vessel of 49 gross tons; motor (gas), 14 vessels of 182 gross tons.

The steam vessels were oil burners of steel construction, of 8800 horsepower each. They were the SEATRAIN HAVANA and the SEATRAIN NEW YORK, described elsewhere in this issue.

A Sperry gyro compass equipment has been purchased by the Canadian government for the OCEAN EAGLE, a large ocean-going tug operating out of Port Churchill on Hudson bay.

General Traffic Manager United Fruit Co.

J. J. Kelleher, formerly assistant freight traffic manager, United Fruit Co. at New Orleans, has been appointed general traffic manager with headquarters in New York. Mr. Kelleher was formerly traffic manager of the Cuyamel Fruit Co., New Orleans prior to its amalgamation with the United Fruit Co. several years ago. He comes to his new post with many years of executive experience in the field of general traffic and steamship transportation both in the United States, Central and South America. He has a wide acquaintanceship in traffic and shipping circles throughout the Americas, and he will now direct the far-flung operations of the United Fruit Co.'s famous great white fleet which has just been augmented with a series of six magnificent new turbo-electric liners.

Three of these new vessels, the ANTIGUA, CHIRIQUI, and TALAMANCA are operating between Panama, Los Angeles and San Francisco. Two others, the VERAGUA and QUIRIGUA serve the Atlantic Coast trade between New York, Havana, Jamaica, Cristobal and Costa Rica, while the sixth and last of the series, the PETEN is scheduled for delivery to the United Fruit Co. by the Newport News Shipbuilding & Dry Dock Co. in February of 1933.

When the PETEN enters service next February it will mark the completion of one of the biggest shipbuilding programs ever carried out in the United States. The new fleet of liners will also have been completed and placed in service in a year's time. This is also believed to establish a record for the number of new ships ever placed in service within a year by one American company.

Frank McWilliams Dies

In the death of Frank McWilliams, at his home in Staten Island, Oct. 12, at the age of 83, the port of New York loses one of its oldest and best known builders of harbor craft. He was active until the end as president of the Frank McWilliams Shipbuilding Co. Inc., Staten Island, and as owner of the Frank McWilliams Transportation Co., Manhattan.

He was born April 30, 1849 in Pottsville, Pa., and as a young man entered the barge transportation business of his father. In 1875 with a brother he opened a shipyard on the waterfront of Jersey City, and shortly thereafter established the McWilliams-Burlee Shipyard on Staten Island, which he conducted for 25 years, selling his interest to the Staten Island Shipbuilding Co. which is now a part of the United Dry Docks Inc. After this he established the present shipyard bearing his name.

Useful Hints on Cargo Handling

SUCCESS in any venture depends principally upon the character and ability of the men directing it. A great business leader has said that no engineers, employed to put a declining business on its feet, ever succeeded unless their efforts resulted in changing the management. They were employed to overcome the results of incompetence and found that this could be done only by changing the personnel in executive charge.

Constant efforts must be made when an organization is forming to get the ablest men in the business to work for it. Money cannot be better invested than in high class men. The success of a stevedoring organization depends chiefly upon the executives.

It is also important that the men who fill these positions are broad enough so as not to permit a certain measure of success to drug their ambition and energy.

Capitalize the habit tendency in men to build good working habits.

If an organization does not strive for a goal it is running wild to the detriment of profits.

A business statesman is one who realizes the difference between a "close up viewpoint" and a viewpoint which includes background, relations and fundamental principles.

A New York terminal reports discharging at the following tons per hatch hour: Lead, 35 tons; nitrate, 30 tons; copper, 35 tons; cotton, 20 tons; coffee, 25 tons.

Inflammable Liquids

NAPHTHA gasoline and sub-products are shipped in drums in cases, or in large steel drums. It goes without saying that these products are highly inflammable and give off invisible gases. Such shipments must be given all possible ventilation and should not be stowed in holds with cargo liable to spontaneous combustion. Neither should products of this kind be stowed in such a way that the gases may enter the stokehold or crew's quarters.

As such shipments have a very strong odor, they should not be stowed in the same hold with foodstuffs and clothing. No naked lights must be used where such cargo is stowed, nor in any places where gases

THIS page is being devoted to short items on all matters having to do with the more efficient turnaround of ships. These items are intended to be of a helpful nature.

We will welcome for this page brief descriptions, illustrated if possible, of any better or safer way of performing any function in cargo handling. Also, any questions submitted will be answered by the editor.

may have penetrated. As a rule, such shipments are generally carried in tank steamers.

Care in Stowing Oils

OIL is shipped in barrels or in cans in cases, and the stowage should be the same as for barrels. Barrels of oil should not ordinarily be stowed in the bridge deck, but if stowed there they must not be headed as the heads and upper part of the barrel will dry and cause leakage. In these circumstances when being discharged the heads may drop out and cause loss of the entire content. Serious damage has resulted from stowing oil in bridge decks.

When loading oil it is important to see to it that the barrels are in good condition and if not, to make an appropriate notation on the bill of lading. When other cargo is loaded over cases of oil, the oil should be boarded over and cargo heavier than cases of oil must not be loaded on top. Foodstuffs and other bagged goods must not be loaded in the same hold with oils giving off odor, such as petroleum, essential oil, fish oil, etc. This applies equally to many kinds of manufactured goods. As most oils are inflammable and volatile precautions must be taken against light and fire.

Standard Platform Slings

THE American Marine Standards committee has recently issued a bulletin on the standard sizes and specifications for platform slings used in cargo handling. Three standard sizes and capacities are proposed without prejudice to the use of intermediate or different sizes where such would better suit the user's needs. The object of the proposed standards are to promote unified practice in cargo handling in the interest of safety and efficiency; and to define sizes and types of platform slings and minimum requirements for their construction in the interest of economical manufacture and upkeep.

The three sizes proposed are, overall dimensions, exclusive of fenders; 36 x 72 inches, 42 x 84 inches, 48 x 96 inches, giving clear loading space of 36 x 68; 42 x 80; 48 x 92 inches. This will give a loading area in square feet of 17, 23 1/3 and 30 2/3 respectively. These platforms will have a capacity for safe load if evenly distributed of 3000, 3500, and 4000 pounds, respectively.

The bulletin presents drawings and complete specifications including the kind of suitable material for building such standard platform slings. Anyone interested may obtain a copy of this bulletin at a cost of 10 cents by applying to the superintendent of documents, Washington, D. C., or by addressing the secretary of the American Marine Standards committee, department of commerce at Washington.

Stowage of Pork Products

BACON is either exported smoked in packages covered with canvas or it is dry-salted in cases. In the first instance, it must be stowed as dry cargo with no weight on top of it. In the second instance, it must be considered as wet cargo and stowed as such. When dry-salted pork products are exposed to higher temperatures, brine will form and cause damage to cargo lying underneath or along side of it. Pork products including bacon and hams are very susceptible to cargoes with a strong odor, and should not be stowed in the same hold.

Guarding and Checking

GENERAL practice should not permit a checker to check more than one truck load at a time. Exception may be made in case of large rolls of paper, large cases and other packages which can be easily checked.

There are certain qualities which are appropriate to the four periods of the business cycle:

Depression—Vision, Imagination
Recovery—Courage
Boom—Sober judgement
Collapse—Patience

Reviews of Late Books

Inland Waterways, a Handbook for All Interested Persons (Die Binnenschiffahrt, ein Handbuch fur Alle Beteiligten), by Oscar Teubert, a completely rewritten and expanded second edition by Dr. Eng. Wilhelm Teubert, assisted by Dr. Werner Teubert, with 377 illustrations, 6 large maps of waterways, a full index, with 976 pages of text, published by Wilhelm Englemann, Leipzig, 1932. Apply to MARINE REVIEW, Penton Publishing Co., Cleveland, for cost, etc.

The saying that no man ever dies who writes a book or has a son is exemplified two ways in this remarkable second edition of the standard work on *Inland Waterways*, by Oscar Teubert. The original work has been the classical textbook on the subject for many years. It has now been completely reworked by his two sons, both having previously won recognition in this field of study. Wilhelm Teubert is the author of numerous works on this subject, especially, *A Cross Section of World Shipping*, 1929, the result of a world study tour, a monumental and useful work. He is a professor of the engineering of marine structures, at the University of Mannheim.

The elder Teubert, who wrote the original handbook, had a distinguished career and was superintendent of the waterways of the Mark Brandenburg. The elder Teubert, in the original work, based his writings upon a thorough and long experience in the practical administration of several of Europe's most important inland waterways. He was preparing a second edition when he died, in 1916, with the manuscript finished and corrected, and part of the book printed. His sons took up the pen where he laid it down, resulting in this present complete handbook, on every phase of inland navigation.

The work covers the economic, technical, operating, political and legal phases of the very complicated questions involved in inland waterways navigation. The original work was not hastily written. Oscar Teubert devoted ten years of painstaking labor to its completion.

The new book is printed in German in clear Roman face type, and as a result anyone familiar with the general subject matter, and having even a rudimentary knowledge of German, can read all of the drawings and most of the text with comparative ease. The numerous illustrations are clear in every detail. Any of the many structural drawings could be used as working drawings for constructions, due to their detail and completeness.

The book is divided into eight divisions, each with several sections.

*This review has been prepared by R. S. MacElivee, B. S., M. A. Ph. D., Consulting engineer on ports and terminals.

First Division

Section one discusses the relationship of inland waterways to the complete economic picture, the relationship of transportation to national economy, the relationship of inland navigation to land transportation and the relationship of inland waterways to contemporaneous transportation problems.

Section two is an historical study of inland waterways, up to the year 1870, including inland waterways of antiquity, inland waterways of the Middle ages, including the invention of lock chambers in A. D. 1438.

Section three covers inland navigation from the invention of the lock to the invention and development of the steamship.

Section four discusses the shipping acts of the congress of Vienna, and the development of inland waterways after the invention of the steamship to 1870.

Second Division

This division pertains to the development of inland waterways since 1870, in Germany and in other countries, including the United States and Canada.

Third Division

In this division the construction of inland waterways and their operation is discussed.

The first section covers natural waterways and current movements in streams.

Second section discusses canals of various kinds, prisms, profiles, location and water supply.

Third section pertains to locks and lifting mechanisms, including various types of locks, also large lifts, lock gates, valves, the filling and emptying of locks, and flights of locks.

Fourth section discusses systems of inland waterways and the standardization of vessel measurements.

Fifth section covers inland waterway ports. First, various types; second, general layout; third, transfer equipment, loading and unloading; fourth, inland harbor administration and operation.

Fourth Division

Section one—Types of vessels for inland waterways.

Section two—Flat carriers without motive power (towed barges).

Section three—Self-propelling vessels.

These chapters are fully illustrated with drawings and photographs and give extremely valuable details for naval architects constructing craft for inland waterways.

Section four—Railway and floating dry docks, self-propelling barges.

Section five—The present status of inland navigation containing a discussion of the influence of the World war and elaborate statistics of the nature and volume of inland waterway activities.

Fifth Division

This division deals with the propulsion of vessels and the resistance of vessels moving in confined prisms in canals, the results of elaborate experiments in resistance, both residual and frictional. Steering in quiet water and in water with currents is discussed. Also various methods of towing and various phenomena of towing, as well as different types in still water and in currents.

Sixth Division

This is a discussion of the business of operating vessels on inland waterways, as an enterprise conducted for profit.

Section one—The business of operating the individual vessel, including the business of towing.

Section two—Large scale and small scale operations.

Section three—Cost accounting systems.

Section four—Enfreightment, with special reference to the building up or solicitation of freight movements, the payments for towing, the proceeds from operation, comparisons of joint water-rail rates and water and rail rates.

Seventh Division

This division refers to the relationship of inland waterways to the state, which has to do primarily with the relationship of German waterways to the German government. Discussions also cover the regulation of inland waterways by the state, the methods of financing inland waterways and the participation of the state in inland waterways, with special reference to the state-owned railways and the inland waterways improved at public expense.

Eighth Division

The volume of inland navigation, including statistics of inland navigation, the increase in traffic from the viewpoint of volume. The third section of this division contains a discussion of inland navigation study according to various waterway systems, the inland waterways traffic, with regard to certain systems, the inland waterways traffic, with regard to certain large centers of activity. In section five the inland waterways in other countries are discussed.

The work is by all odds the most complete treatise ever published upon this extremely technical subject of inland waterways. The authors deserve the highest praise. There seems to be no angle of the subject which has not been discussed clearly and thoroughly. The work should be at the elbow of every interested person, as a starting point for future study and application of these inland nagivation problems to the particular problem at hand to be solved by the engineer in any locality.

Up and Down the Great Lakes

Lake Bulk Traffic—More Ships in Service—Lake Levels—Lay-up Causes Corrosion—Lake Diversion—Illinois Waterway

DURING the month of September the total American lake movement in Lake Superior iron ore totaled 641,228 tons, compared with 4,178,761 tons for the month of September, 1931. Up to Oct. 1 this year the total movement of iron ore was 2,391,155 tons, compared with 19,952,768 tons during the season of 1931 up to Oct. 1.

Total traffic through the Canadian and the United States locks of the Sault Ste. Marie canals for September this year was only 3,806,23 tons, as compared with 7,126,234 tons in September, 1931. It is interesting to note that wheat shipments showed a large increase from 18,855,618 bushels in September, 1931, to 44,166,819 bushels in September, 1932. Other grains also showed an increase, from 3,216,857 bushels to 4,550,611 bushels. Iron ore, however, decreased from 4,423,371 tons to 688,205 tons which is what has so seriously affected American vessels.

Traffic through the Welland ship canal continues heavier this year than last. The only commodity to show large decrease was iron ore from 71,604 tons in September, 1931, to 10,000 tons for September, 1932. Wheat increased by 281,022 tons, pulpwood by 25,386 tons, oats by 19,720 tons, gasoline by 17,867 tons, and corn by 16,244 tons, raising the total from 968,763 tons in September, 1931, to 1,292,203 tons in September, 1932. Since the opening of navigation up to Oct. 1, 6,050,525 tons of freight have used the canal, as against 5,364,577 tons for the corresponding period last year.

More Ships Commissioned

Since reporting last month on the number of bulk cargo vessels commissioned during this season, there has been again a definite increase in vessels entering service. On Oct. 1 of the 332 vessels rated as bulk cargo carriers on the Great Lakes, 114 of 949,100 tons carrying capacity were in commission, representing 34.34 per cent of the total fleet, as against 90 with a total trip capacity of 747,700 tons representing 27.10 per cent of the total fleet on Sept. 1. Of the 114 vessels in commission Oct. 1, 24 were engaged in the ore trade.

It is questionable whether there has been any increase in the net number of vessels in commission since Oct. 1. Vessel operators look for a fairly early closing of the season. On the other hand, recent cargoes of bituminous coal have been going forward at a volume nearly equal to that of a year ago. To and including Oct. 16, some 18,608,205 tons have been shipped this year which compares with 26,241,216 for the same period a year ago, 32,656,263 two years ago and 33,115,182 in the corresponding period for the season 1929.

September Lake Levels

The United States Lake survey reports the monthly mean stages of the Great Lakes for the month of September as follows:

Lakes	Feet above mean sea level
Superior	602.94
Michigan-Huron	578.28
St. Clair	573.94
Erie	571.22
Ontario	245.04

Lake Superior was 0.02 foot higher than in August and was 0.65 foot higher than the September stage of a year ago.

Lakes Michigan-Huron were 0.26 foot lower than in August and they were 0.36 foot lower than the September stage of a year ago.

Lake Erie was 0.29 foot lower than in August and it is 0.02 foot lower than the September stage of a year ago.

Lake Ontario was 0.55 foot lower than in August and it was 0.45 foot higher than the September stage of a year ago, 0.61 foot below the average stage of September of the last ten years.

Find Signs of Corrosion

So secure have vessel operators on the Great Lakes felt against any possible damage to their floating property due to corrosion that the report that they are faced with this menace to their laid-up inactive ships comes as a startling and unpleasant surprice.

An investigation is said to have brought out that a number of inactive ships lying at the same anchorage for a long period of time are beginning to show signs of corrosion.

The American Ship Building Co. recently undertook an experiment at its Lorain, O., yard for the purpose of overcoming this trouble. The subject to the experiment is the steamer PERCIVAL ROBERTS JR. of the Pittsburgh Steamship Co. The hull is being treated with paint and other compounds to overcome corrosion. A close watch will be maintained to establish the results of the experiment.

Consider Lake Diversion

The lake diversion case which involved Chicago and nearby states in sharp controversy a short time ago has been reopened before the United States Supreme Court, with the filing of an application by Wisconsin, Minnesota, Ohio and Michigan for the appointment of a special officer of the court to complete the sanitary district's construction program. In the last two semiannual reports of the district's officials it was stated that their work had been curtailed through financial difficulties.

An earlier decree directed sharp curtailment on water diversion through the Chicago sanitary canal by 1938. The application of the states requested the court to grant a special agent authority to bind the credit of Illinois and execute a lien against resources of the sanitary district to force early compliance with the building program prescribed. At the recent rate of construction of sewage disposal plants, it was declared that it would require 37 years for Chicago to complete this work. Negligence is charged in providing for financing the performance of the court's original decree.

Waterway Nearly Ready

Illinois' waterway connecting Chicago and the Great Lakes with inland cities and the Mississippi river practically is completed, and if it were not for the approach of winter could be opened to commerce within a few days. An inspection trip by 200 business men recently of the 60 miles of channel between Lockport and Starved Rock, Ill., revealed that little work remains to be done. Formal opening is expected to take place about March 1, 1933. According to Lieut. Col. Daniel I. Sultan of the United States engineers, 10,000,000 tons of commerce should be moving over the waterway within a short time after the opening.

Intercoastal Lines Choose Thackara Chairman

It looks as though the new United States Intercoastal conference recently organized is the best arrangement so far made to serve all of the shipping interests in intercoastal trade. Robert C. Thackara has been appointed chairman. The policy administration of affairs, over which he will have executive jurisdiction, will be controlled by five members representing the several classes of lines in intercoastal service.

Rate making will be left completely in the hands of a neutral and paid member rate committee. The chairman will not be called upon in the matter of fixing rates but will have direct charge of personnel and relations with shippers and other administrative duties.

Toledo Port Facilities

T. V. O'Connor, chairman of the shipping board, announces the publication of a new report on the port of Toledo, O. This report is one of a series covering the principal ports on the Great Lakes, prepared and published by the bureau of marine development, United States shipping board, and the board of engineers for rivers and harbors, war department.

The reports in this series are similar in scope and purpose to those in the port Series covering the principal ocean ports, and are intended for the information and use of federal, state, municipal and port agencies, and others interested in the development of harbors and the establishment of port and terminal facilities. They also contain information useful to shipping and transportation interests in connection with the movement of goods through the various ports.

The report on Toledo contains information with regard to port and harbor conditions; port customs and regulations; services and charges; fuel and supplies; and facilities available for service to commerce and shipping, including piers, wharves, grain elevators, dry docks, marine repair plants, storage warehouses, bulk freight storage, floating equipment, wrecking and salvage facilities, railroad, steamship and air lines and their charges and practices in connection with terminal service.

American Ship Building Co.

W. H. Gerhauser, president of the American Ship Building Co., Cleveland, in his annual report, recently issued, calls attention to the drastic decline in shipping activities. He said in part: "For the past two seasons ship building on the Great Lakes has been at the lowest ebb in many years, and as a consequence the company's fiscal year just closed has been unprofitable. No new ships were constructed on the Great Lakes, and on account of the very limited operation of the lake fleet, accidents were few. A resumption of normal business will bring a substantial volume of repairs because of deferred maintenance.

"On the average, not over 25 per cent of the bulk freight vessels on the lakes have been in operation this season, and, many in service have run only a few trips. Unless there is a large movement of grain during the remainder of the season, no increase in the number of vessels in commission can be looked for. Winter repairs will therefore be small in volume and no new construction can be anticipated until a substantial part of the present fleet is again in service. An increase in operations will depend almost entirely upon improvement in the steel industry."

While no decision has been reached up to the time this is written in regard to the building of a third ship similar to the MANHATTAN, officials of the United States lines do have in mind another sister ship for this service, if popular support of the first two vessels warrants such a step.

Oppose St. Lawrence Seaway

The North Atlantic ports maritime conference, organized about 18 months ago for the purpose of promoting the interest of the North Atlantic ports, met at Baltimore recently. Frank S. Davis, manager of he Maritime association, of the Boston Chamber of commerce, represented Boston, and representatives of the ports of Baltimore, New York, Philadelphia and Hampton Roads were also present.

Among the topics considered was the proposed Great Lakes-St. Lawrence seaway project. It is expected that most of the North Atlantic ports will submit testimony in opposition to the project before Senator Borah's committee, which will begin hearing on the subject when congress convenes in December.

Organize Marine Club

The Merchant Marine Club of Boston Inc. has been organized with Francis Minot, naval architect, president, George Gibbs, vice president, Frank Dressel, secretary and treasurer and Albert T. Gould, chairman of the board of governors. Membership includes many of those who withdrew a few months ago from the Propeller club. The purpose of the new organization is to bring prominent speakers before the members at a series of luncheons.

The freighter SAN VINCENTE and the steamship IROQUOIS were reported in collision in Puget Sound, Oct. 7.

Stricken from Records of Merchant Marine

The statistical summary of American vessels totally lost, broken up, condemned, and otherwise unfit for further service, for the fiscal year ended June 30, 1932, made public Oct 12 by A. J. Tyrer, assistant director of the commerce department's bureau of navigation and steamboat inspection, showed the gross loss of the American merchant marine to be 758 vessels of 181,613 gross tons. This does not include vessels engaged in pleasure only

Of this total, 150 vessels of 111,765 gross tons were steamers, 407 vessels of 11,493 gross tons motor, 69 vessels of 18,863 gross tons sailing, and 132 vessels of 40,092 gross tons were canal boats, barges, scows and other unrigged types.

The 1931 total was 935 vessels of 489,142 gross tons, or a decrease in loss in 1932 of 177 vessels of 307,529 gross tons. In the steam class there was a decrease of 79 vessels of 281,815 gross tons, in the motor 12 vessels of 1006 gross tons, and in the sailing 33 vessels of 29,706 gross tons, while the unrigged class shows a decrease of 53 vessels and an increase of 4998 gross tons.

During the year just ended 486 vessels of 113,137 gross tons were abandoned or scrapped as unfit for further use, while 272 vessels of 68,476 gross tons were lost due to casualty.

Stranding, foundering and burning are the most prolific causes of disaster. To such casualties are attributable approximately 95 per cent of the vessels lost. Of the steam and motor vessels the number burned is about equal to those which are stranded or foundered, but only about 10 per cent of the sailing vessels are lost by burning. Collisions, vessels abandoned at sea, and missing ships constitute the remaining 5 per cent of casualties.

Passenger Traffic Manager

C. H. C. Pearsall, vice president and general manager of the Colombian line, announced recently that James P. Sutherland, formerly assistant passenger traffic manager of the Panama Mail Steamship Co. has been appointed passenger traffic manager of the Colombian line, with headquarters at 17 Battery Place, New York. Mr. Sutherland's appointment follows the recent launching of two new steamers, the COLOMBIA and the HAITI, which the Colombian line will place in service this winter between New York, Haiti, Colombia and the Panama canal. The COLOMBIA is scheduled to make her maiden trip Nov. 24 and the HAITI on Dec. 22.

Prior to his connection with the Panama Mail, Mr. Sutherland, who is widely known among railroad and steamship passenger men, was associated with Thos. Cook & Son.

Equipment Used Afloat and Ashore

Special Paints on Manhattan—A New Rubber Paint Developed—Vertical Steam Engine Improved—British Naval Shipbuilding Program

STARTING from the premise that there was a chance for improvement in paints E. I. du Pont de Nemours & Co., Philadelphia, has developed a distinctly new type of finishing material. The new material known as "Dulux" it is claimed, has greater durability than orthodox products; is extremely resistant to moisture and salt air; does not chip or crack; and holds its fine appearance longer than ordinary finishes.

When the S. S. MANHATTAN, great new United States lines ship, sailed on her maiden voyage, all her interiors, with the exception of the engine-room, crews' quarters, and holds, were finished in this new DuPont material. It was furnished to the New York Shipbuilding Co. in white, in three sheens—high gloss, semi-glass and eggshell, and was tinted to specification on the job. Application varied, both spray and brush being used according to conditions.

DuPont "Duco" was also used as the finishing coat on much of the interior hard wood paneling.

Now that the MANHATTAN has taken her place in the American merchant marine, this new material has been adopted as the standard maintenance finish, both inside and out. Her sister ship, the WASHINGTON, now building at the New York Shipbuilding Co., will also be finished extensively in the same manner.

Rubber Paint Developed

A NEW line of rubber paints, has been edveloped and recently marketed by the B. F. Goodrich Rubber Co., Akron, Ohio. A manual of recommendations for paint problems has been issued which also tells about rubber derivatives that minimize the corrosive action of acids and alkalies on materials.

These paints have as a base a commercial form of rubber isomer, developed by the Goodrich laboratories, which imparts valuable properties not found in ordinary paint films and characterized as follows:

1 Exceptional properties of adhesion when applied to a properly prepared surface.

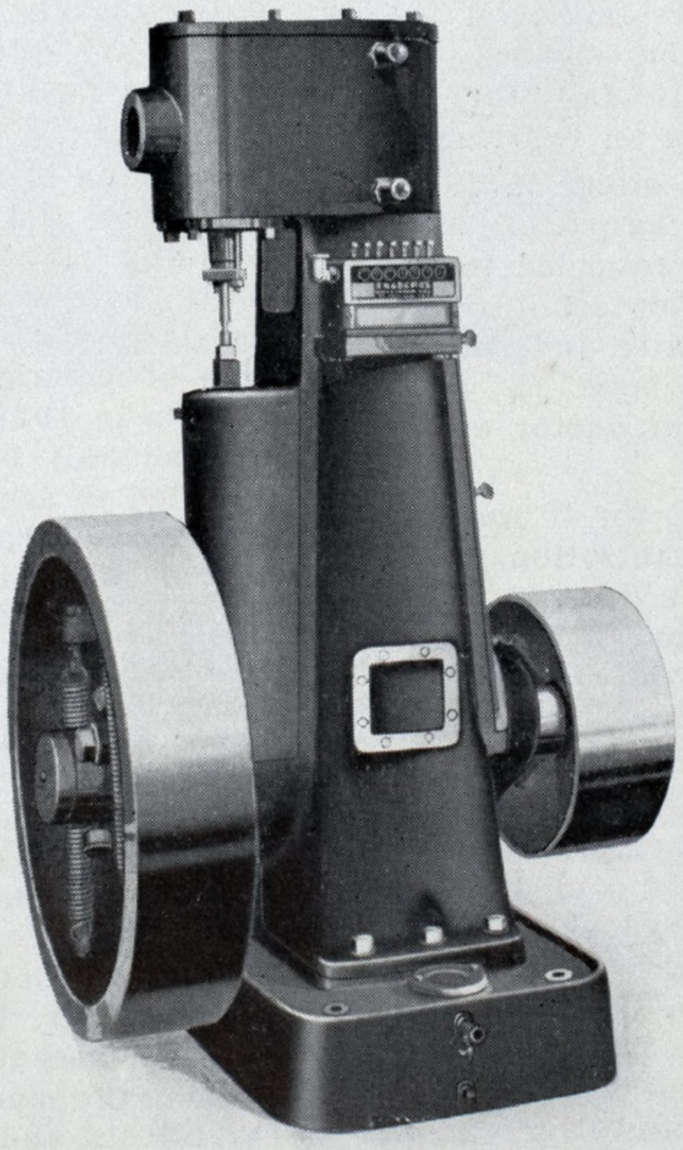
2 Dry in one hour to a hard firm film but retain to a remarkable degree the elastic properties of rubber and consequently conform to the expansion and contraction of the support.

3 Retaining the well known chemically resistant properties of rubber, they provide a protective coating that minimizes the corrosive action of acids, alkalies and chemical fumes. Film is not water absorbent.

The bulletin discusses selection of proper paint and primer for various purposes, methods of application, ingredients, describes finished results, spreads per gallon and operations in which different types have been used successfully. The Goodrich research division is ready to work on any paint problems for special purposes. Copies of the bulletin may be had on request to the manufacturer.

Vertical Steam Engine

IMPROVEMENTS of an important nature have recently been made in the vertical steam engine manufactured by Troy Engine & Machine Co., Troy, Pa. One of the outstanding features is the use of the new watershed partition between the cylinder and crankcase. No part of this watershed partition comes in contact with the piston rod, thereby eliminating wear and change in operation of the equipment due to wear. In this way practically all of the water from the cylinder is prevented from getting into the oil reservoir at the base of the engine, thus eliminating to a large extent any difficulty from emulsification of the lubricating oil. Nor can the lubricating oil follow the piston rod to the top of the watershed where it would escape into the drain. Before adoption of the new design, the watershed could be drained to an outside source but there was considerable loss of lubricating oil in such cases; or alternately the watershed could be drained into the base of the engine which prevented loss of oil, but with the attendant difficulty of more or less emulsification.



Improved Type Troy Vertical Steam Engine

The company now has available these type E engines as shown in the accompanying illustration with either flat or piston valve in the 10-inch stroke size. The two types of valves will be available on all sizes as quickly as possible. This is of importance to the operating engineer because the flat type of valve is better suited to an installation subject to considerable quantities of water which might cause difficulty with the piston valve type of engine. On the other hand, the piston valve type is considered better equipment for operating on high pressure, superheated steam free from water.

The Troy company will in the near future also introduce a 12-inch stroke vertical engine with a rating of 160 brake horsepower at 300 revolutions per minute for full load, 24-hour, continuous service, at a maximum speed of 325 revolutions per minute. At the present time, this company is ready to supply single cylinder engines from 1 to 225 horsepower and duplex engines from 2 to 450 horsepower in both vertical and horizontal types.

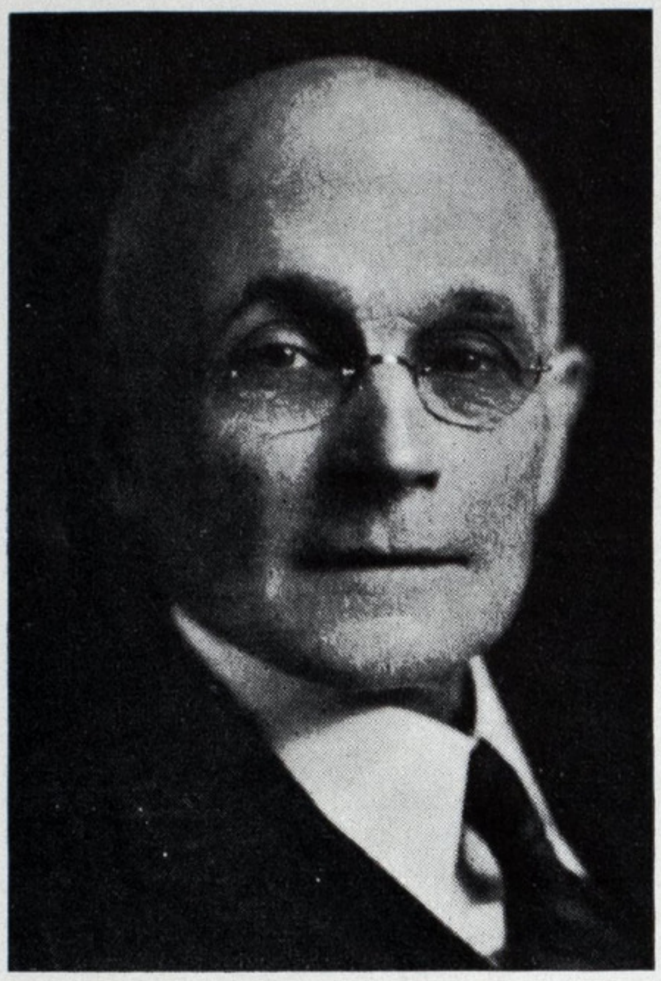
British Naval Program

ACCORDING to word from London, a large naval program will be under way before next March. It is expected that contracts will be placed for a total of 43 warships at an estimated cost of $100,000,000. Shipyards, navy dock yards and marine engineering plants anticipate an unusually busy season. The contracts involved are included in the two programs for the years 1931 and 1932 respectively. The first of these has been held back for the past 18 months. In the two programs are four 7000-ton Leander cruisers; two 5500-ton Arethusa cruisers; two Flotilla leaders and sixteen destroyers; eight sloops; six submarines; two gunboats; three depot, or auxiliary ships.

Personal Sketches of Marine Men

Hugo P. Frear, Consulting Naval Architect, Bethlehem Shipbuilding Corp.

By Ben K. Price



IN LENGTH and breadth of experience, in keen intellect and in the practical value of his work, he stands pre-eminent in his profession.

NO OTHER man has better exemplified the use of theoretical knowledge in the effective solution of many difficult practical problems.

AN INSTINCTIVE common sense and appreciation of ability in others have characterized his whole career in naval architecture and shipbuilding.

ROUNDING out 48 years of high accomplishment in the shipbuilding industry, Hugo P. Frear today stands pre-eminent in the ranks of American naval architects. Despite a career spent almost entirely with one organization, his work has been spread over a wide field of achievement, acclaimed generally by shipping men here and abroad.

Born June 19, 1862, in Grass Valley, Calif., a mining camp, the son of a Congregational minister, Mr. Frear at the age of eight went with his parents to Honolulu, where he was to live for 10 years. He sailed on the old wooden side-wheeler, MOSES TAYLOR, dubbed the "Rolling Moses" and requiring about 10 days for the trip. Travel on this steamer was always an experience.

Mr. Frear was graduated from Oahu college in 1878, after which he worked for two years in the pattern shop of the Honolulu Iron Works. He then returned to the United States and entered Worcester Polytechnic institute, Worcester, Mass., where he graduated in mechanical engineering in 1883. From this school, 45 years later, he received the honorary degree of doctor of engineering.

His next move was a memorable one, for it was the beginning of an affiliation with one organization which to date has extended 48 years. At that time, in 1884, he entered the employment of the Union Iron Works, San Francisco, which was just entering the shipbuilding field with the construction of its Potrero plant.

He was set to work on plans for the new plant, with his attention devoted especially to the design and placement of equipment. As a matter of fact, he designed much of the hydraulic equipment himself, and drew up plans for a 6000-ton hydraulic lifting drydock, the first of its kind on the Pacific coast, and possibly the only one of two of somewhat similar character in the world, the other being in India. This drydock was later to be destroyed at the time of the San Francisco earthquake in 1906, a catastrophy which was to bring to Mr. Frear an important experience in the salvaging of ships. He was placed in charges of raising at least five large ships which went down at that time, including the DAMARA.

From early in his affiliation with the Union yards Mr. Frear carried the title of naval architect, and on May 1, 1906, he was given the added duties of superintendent of hull construction, duties he held until Nov. 1, 1917. During these years he designed numerous vessels of various types, from tugs and small river steamers to torpedo boats and naval cruisers. He designed the 22½-knot imperial Japanese cruiser, CHITOSE, the fastest of its type built in this country up to that time, and also the United States navy torpedo boat FARRAGUT, which had a speed in excess of 30 knots.

In 1917, Mr. Frear was brought to Bethlehem, Pa. as chief naval architect of the Bethlehem Shipbuilding Corp. Ltd., which some years before had acquired the Union Iron Works and which was then consolidating the designing and drafting operations of its various shipbuilding plants. This was during the world war and more than 500 draftsmen were gathered at Bethlehem, the largest assembly of the craft, it is said, in the history of American shipbuilding.

Late in 1926 Mr. Frear retired and went abroad. But he had only been gone some five months when he was recalled to accept the vice presidency of the Marine Engineering Corp., established in Philadelphia by the Bethlehem Shipbuilding Corp., the New York Shipbuilding Co. and the Newport News Shipbuilding & Dry Dock Co. to prepare the detail plans and purchase orders for eight light cruisers, for use in the three private yards and in three navy yards.

During the progress of this work, Mr. Frear was retained as a consultant by the Matson Navigation Co. in connection with the MARIPOSA, MONTEREY and LURLINE.

Since the work of the Marine Engineering Corp. was completed, Mr. Frear has been consulting naval architect for the Bethlehem Shipbuilding Corp.

While Mr. Frear has resigned from many organizations in recent years, including several abroad, he still retains the membership in the American Society of Naval Architects and Marine Engineers, of which he is vice president; American Society of Mechanical Engineers; American Society of Naval Engineers; Engineers club of New York; and the University club of Boston.

European Shipping

(*Continued from Page* 31)

that is the order for 11 first-class tramp steamers of 9000 tons deadweight which was given some time ago by Messrs. Harrison. These ships are now being completed steadily and are giving excellent results on service. Every reasonably priced fitting which makes for economy has been installed in the engine room while the hull lines, particularly aft, and the most up-to-date rudders combined to reduce resistance and make for speed and economy. These ships have undoubtedly started a new era with regard to tramp construction and it will be interesting to see to what extent it is followed when the owners can once again afford to order.

Passenger Travel Improves

Although the higher priced passenger accommodation has been hard hit the season has not been at all a bad one in the cheaper sections. As far as the third tourist class is concerned, and to a lesser extent the cabin, the North Atlantic season has been a reasonably good one while yachting cruises in these two classes have been booked to capacity and the companies have found it necessary to take more and more ships off the regular service to put on cruisers. Unfortunately some of these expeditions were not as successful financially as their bookings would suggest, for the owners gave tremendous value for the money and in finding novel programs they ran up the expenses in a manner which will not be repeated next year, although there is no reason to suppose that the prices will have to be increased or the programs decreased; it is just a matter of adjustment.

The third tourist yachting cruise certainly seems to have come to stay and it is also interesting to note how the class is penetrating into practically all services. The P. & O. is already doing a big third tourist business to Australia and now the Ellerman lines are making a special drive for it on their Indian service and are converting a number of ships for the purpose.

Considering the gallantry of the effort and the risk that was run it is most gratifying that the EGYPT salvage has been crowned with success, although there is a lot of treasure still in the wreck. But the contractors have already been well paid for their enterprise, and with the recent rise in the price of gold the underwriters have got a good return against the loss that they paid out years ago. Just as important, the novel types of salvage gear used in this attempt have been fully vindicated.

Puerto Rico Lighthouses

Although the recent hurricane did considerable damage to lighthouses and other aids to navigation in Puerto Rico, steps were immediately taken to re-establish all aids, according to the lighthouse service of the department of commerce. The report from the superintendent of lighthouses in San Juan, told how the lighthouse tender ACACIA, seeking refuge from the hurricane put into a safe harbor, was later blown ashore, floated again without damage, and immediately after the worst of the storm had passed put to sea again to carry relief to sufferers and damaged stations.

Among the lights which were extinguished during the hurricane was the Catano range in the harbor of San Juan. At the easterly end of the island Cape San Juan light, and the light on the nearby Largo shoals were both put out of commission. Culebrita Island light, marking the west side of the Virgin passage was also extinguished.

Packing Cases for Export

The Transatlantic associated freight conferences have studied and are continuing to study the acceptance of fibre cases in overseas shipments. One of the most recent conclusions of the conference was that it should recognize the results obtained by the efforts of the Export Fibre Case association to demonstrate the suitability of fibre shipping cases for export where proper standards of materials and construction of such cases have been adopted.

Favorable action along this line is expected, though none has so far been reported. The conference desires to fix a reasonably prompt effective date for the plan and from which date, until further notice, shipments of canned goods and dried fruit in cases bearing the Export Fibre Case association mark are to be rated on the same basis as shipments in strapped wooden cases. The conference also expects to designate other items for which proper container standards may from time to time be determined, to permit the use of these cases.

The conference is of the opinion that it is desirable for manufacturers to co-operate for the purpose of producing the highest grade of containers.

Italy's Bid for Trade

Shortly after the advent of the famous REX, the new 20-000-ton Italian motorship NEPTUNIA sailed from Trieste on her maiden voyage to South America. It is the intention to establish a deluxe seven-day service across the South Atlantic from Gibraltar to Pernambuco. The OCEANIA, a sister ship of the NEPTUNIA, is to be placed in the same service next spring. Both vessels are the products of an Italian shipyard and were built for the Cosulich line. In this way Italy is now making a bid simultaneously for a greater share in both the North and South Atlantic passenger trade. The new REX will be followed in the New York service by CONTE DI SAVOIA.

Mechanical Equipment

(*Continued from Page* 41)

ous less than carload lot shipments. Trailers are backed up to a platform on two sides. A trailer is provided for each inland rail point of destination. The packages are trucked with two wheel hand trucks from the Chesapeake bay boats to platforms, where they are segregated to the various trailers. The loaded trailers are made into trains and are hauled to the outbound railroad cars with electric tractors.

This combination of hand trucks and tractors and trailers, provides for the separation of marks, and then does the major job of hauling with a type of equipment which does hauling economically. The hand truck is used to separate the marks, but the tractors and trailers are used for the long hauls.

Operation Should be Analyzed

At other terminals the slingload is separated to trailers which have been spotted alongside the ship opposite to the hatch.

The most effective operation of tractors and trailers and supplemental equipment on any terminal depends on a thorough analysis of the operation in all its details, such analysis to be guided by the fundamental principles of transportation. Flexibility in methods and equipment and the organization that directs them applied to the economical handling of cargo is vital if the *best* results are to be obtained.

Reduction in Fares

Reductions of from twenty to forty per cent in the higher priced accommodations on the boats of the Canadian National Steamships plying between Boston and the West Indies, will be put into effect in November, according to an announcement by the company. The new rates will apply to all boats in the fleet except the PRINCE HENRY which operates between Boston and Bermuda only at special rates.

Lake Steamer Goes Down

The Canadian steamer, JOHN J. BOLAND JR., of the Sarnia Steamships Ltd., Port Colborne, Ont., foundered in Lake Erie on Oct. 5, shortly after leaving Erie, Pa. with a cargo of 3550 tons of coal. Including a stewardess, four lives were lost. Causes of the accident, which seemed to be due to a sudden squall, have been under investigation by Capt. L. A. Demers, Canadian wreck commissioner.

Marine Review

Reg. U.S. Pat. Off.

The National Publication Covering the Business of Transportation by Water

Main Foyer, T. S. S. MANHATTAN

November, 1932

NEW floating post-office is powered with F-M DIESEL

On midnight of June 30, 1932, the Motorship "G. F. Becker" replaced the Steamer "C. F. Bielman", which had been delivering mail to vessels passing through the Detroit River since this service was established by the Postoffice Department in 1895.

The maintenance of this service requires *absolute reliability* in order that all vessels passing through the harbor can be met without delay. In addition to reliability, it requires *speed*, as well as *ease* and *accuracy* of control and maneuverability.

These are all afforded by the 5 cylinder, 125 hp., Model 35 Fairbanks-Morse Diesel Engine with a single-lever control. This engine is a direct reversing type operated from the pilot house and gives the vessel a speed of 13 to 15 miles per hour.

The welded steel hull was built by the Hansen Welding Co. by a special system of electric overlap welding. Principal dimensions are: Length—64 feet, 9 inches; Breadth—16 feet; displacement—29 tons. Fairbanks, Morse & Co., 900 South Wabash Avenue, Chicago, Illinois.

FAIRBANKS-MORSE diesel engines

5743-OA 27.407

POWER PUMPING AND WEIGHING EQUIPMENT

Vol. 62, No. 11, Nov., 1932, issue of MARINE REVIEW, published monthly at Cleveland, O. Entered as second class matter at the post office, Cleveland, Ohio, under the act of March 3, 1879. Subscription price $3 a year in U. S.; Canada $4; Great Britain, £1:45; single copies, 35c

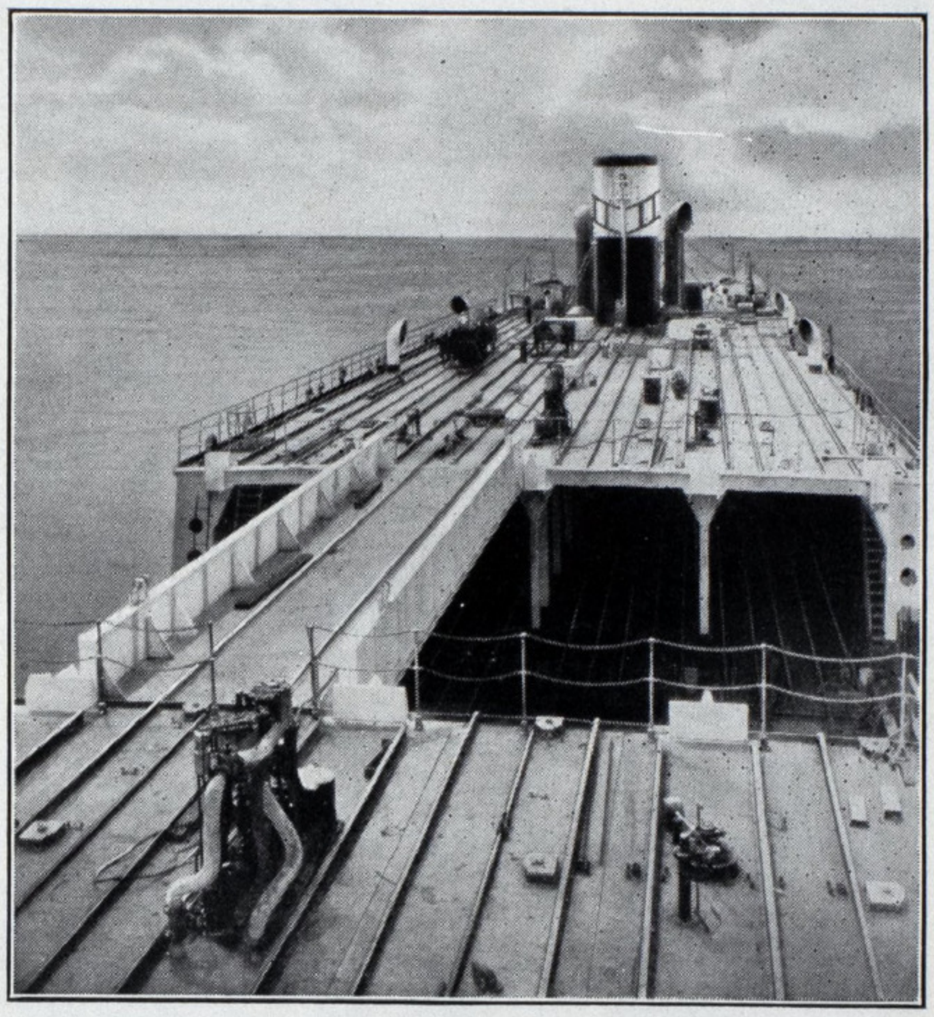
Modern Steam *for* Seatrain Lines

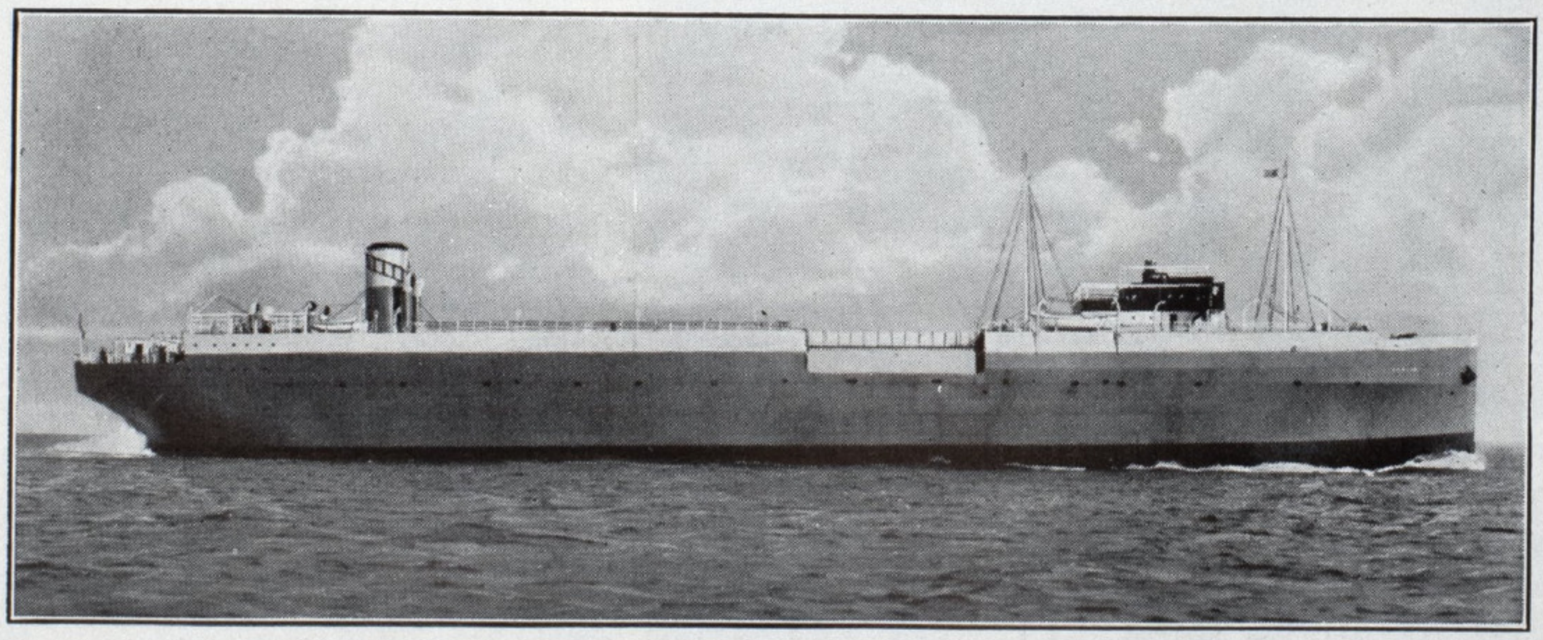
FLEXIBILITY of design, compactness of installation, and efficiency of operation characterize the Babcock & Wilcox Equipment aboard the S. S. *Seatrain New York* and S. S. *Seatrain Havana*.

These ocean-going freight-car carriers of the Seatrain Lines, Incorporated, are fitted with B & W Marine Boilers equipped with Babcock & Wilcox Superheaters, Desuperheaters, Feedwater Regulators, and Mechanical-Atomizing Oil Burners. The furnaces are lined with B & W No. 80 Firebrick.

These units are designed to deliver steam at 420 pounds pressure and 700 degrees fahrenheit total temperature. The space occupied is but minimum . . . the draft loss is exceptionally low . . . and the overall efficiency insures economical operation.

The Babcock & Wilcox Company . . . 85 Liberty St. . . . New York





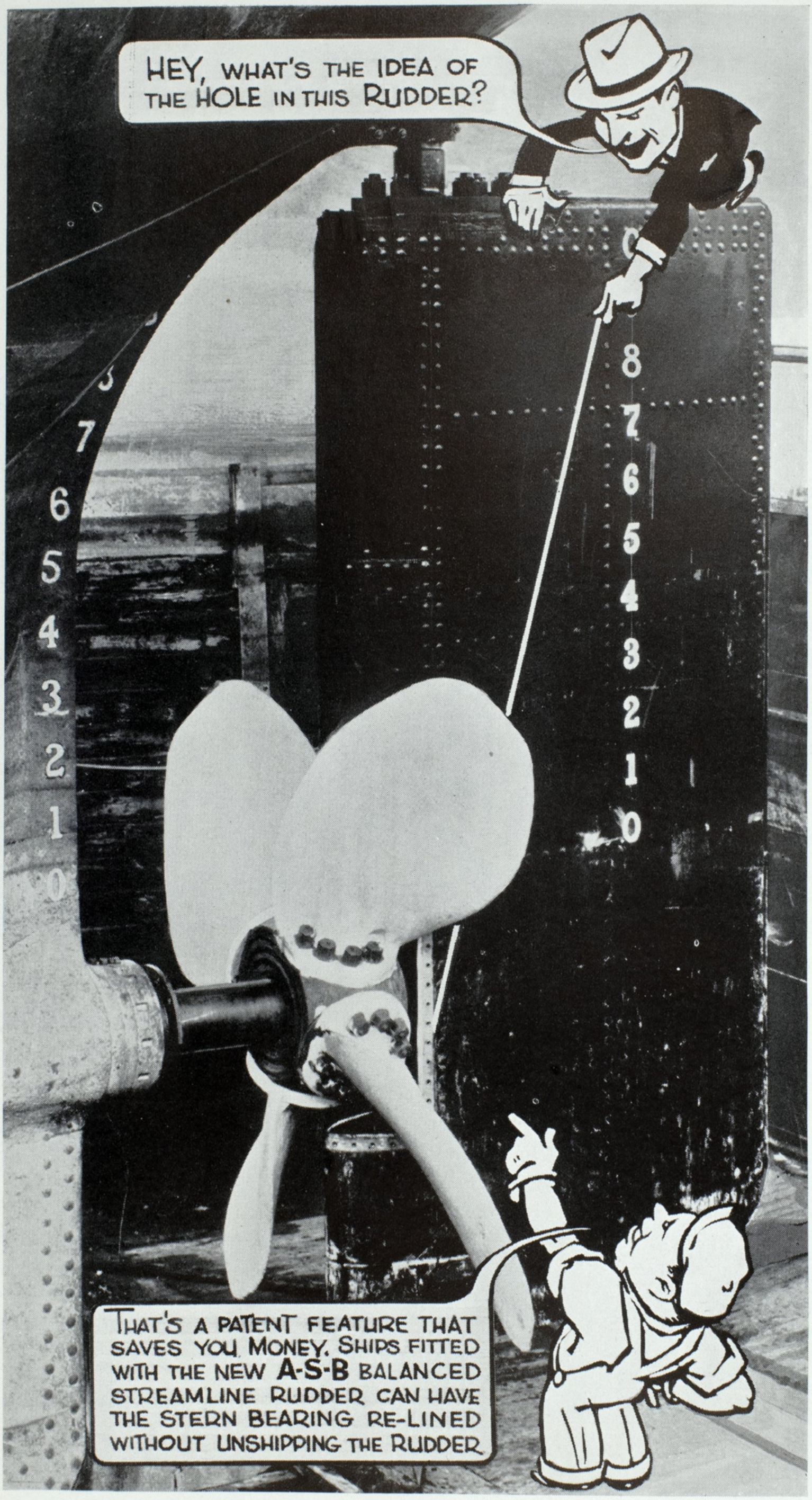
BABCOCK & WILCOX

BABCOCK & WILCOX

Marine Products

Water-Tube Boilers
Desuperheaters
Superheaters
Economizers
Air Heaters
Oil Burners
Stokers
Refractories
Oil Separators
Feedwater Regulators
Water-Cooled Furnaces
Pulverized-Coal Equipment

M-18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Improved Steering. Vessels equipped with the new A-S-B balanced streamline rudder respond to the slightest angles of helm. Thus it is easier to maintain a straight course.

2

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5

Easier Repairs. A watertight manhole permits complete internal inspection and periodic painting. A special patented feature of this new rudder makes it possible to withdraw the tailshaft sufficiently to re-line the stern bearing without unshipping the rudder.

This new rudder is designed and built for service on the Great Lakes by the Lake's oldest and most experienced ship builders. It is exceptionally efficient; simple; and low in cost. It can be quickly installed on any lake vessel and requires no alterations.

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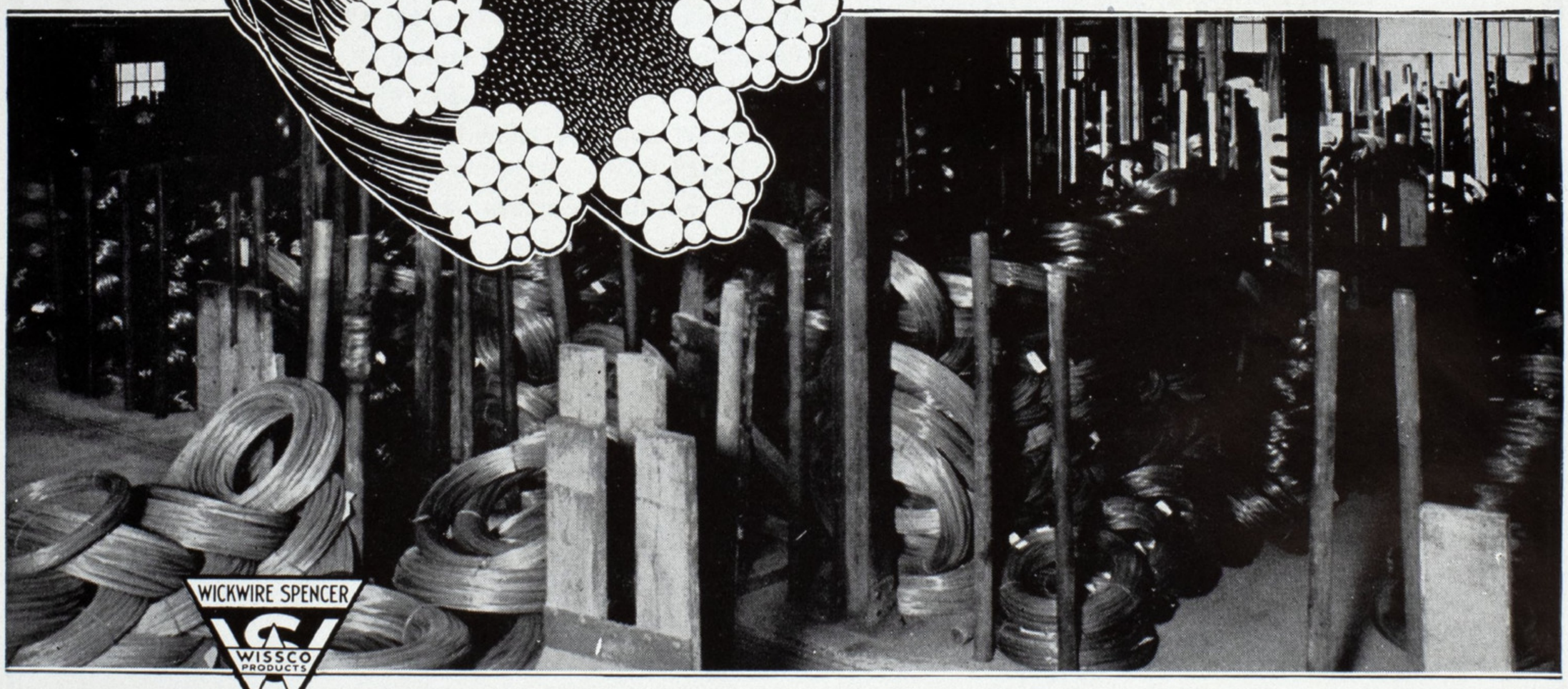

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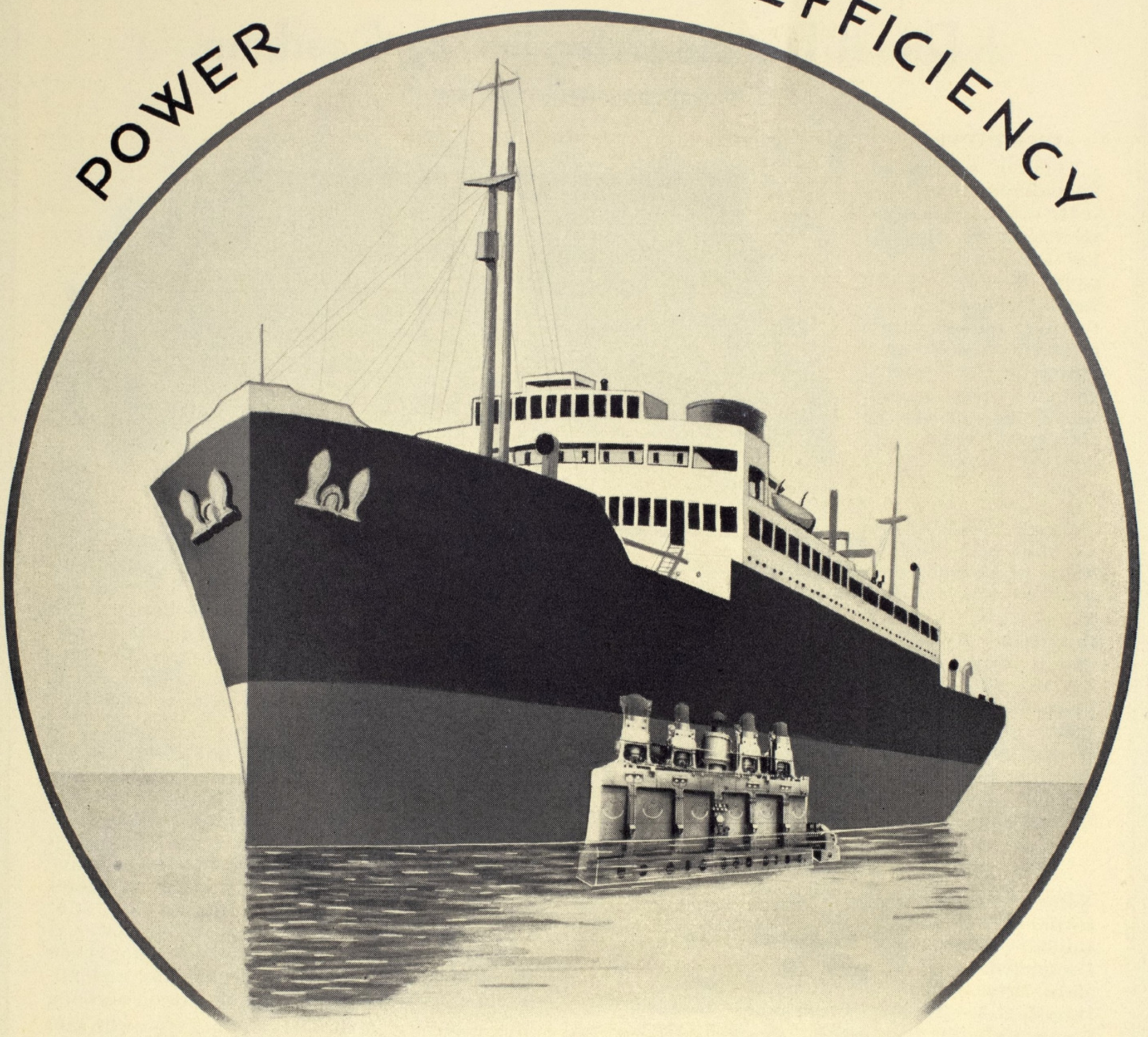

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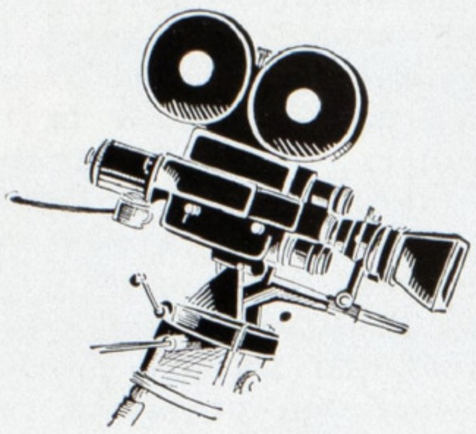
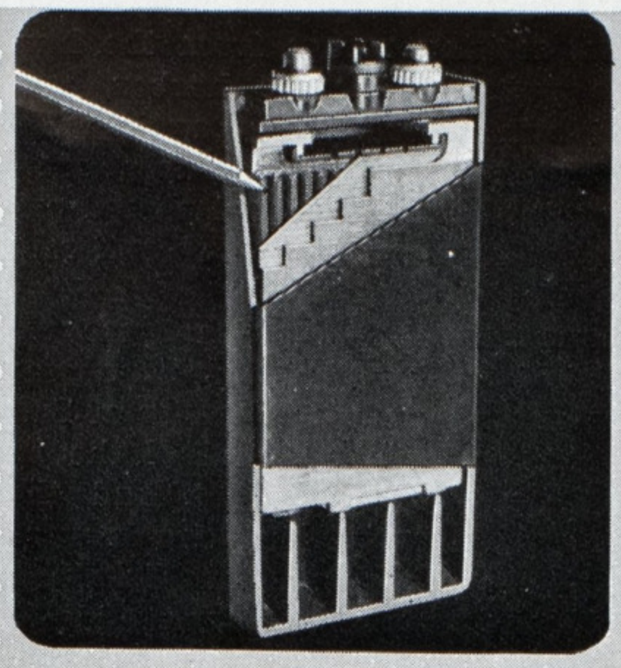


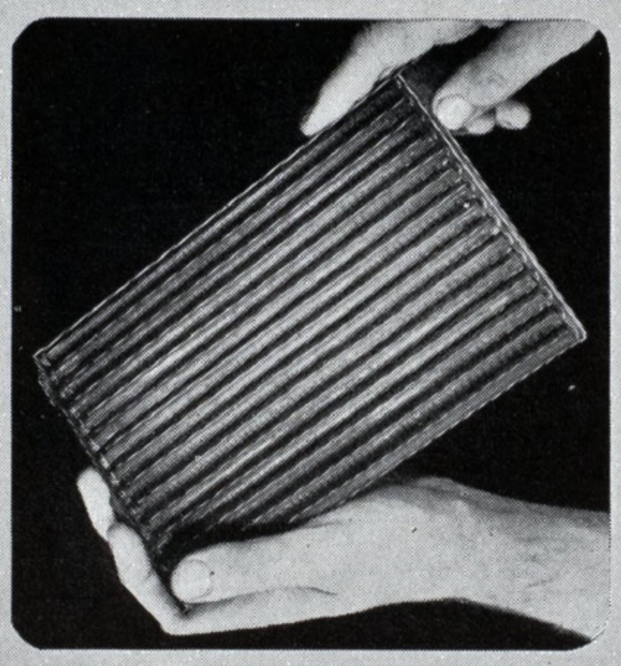
See why the Exide-Ironclad Battery costs so little to operate —lasts so long in marine and industrial truck service

Find out today more about the Exide-Ironclad Battery . . . how it can save you real dollars.

Exide
IRONCLAD
BATTERIES

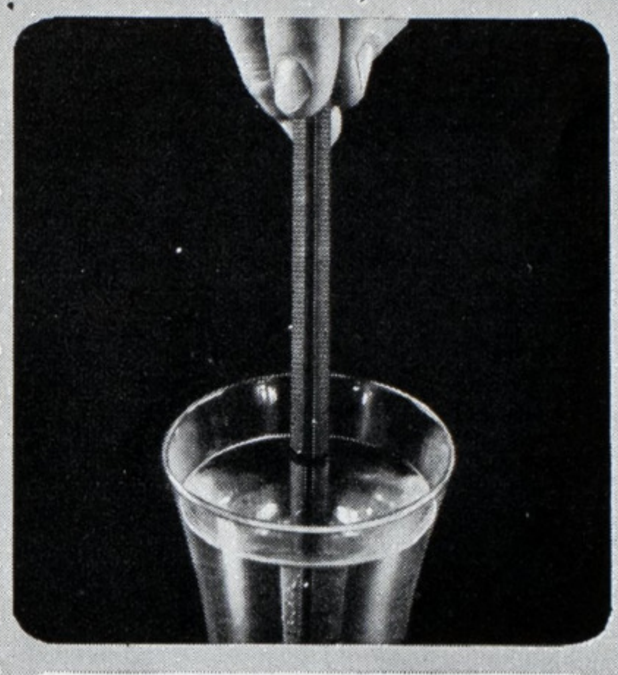


HERE YOU SEE an Exide-Ironclad cell, cut away to show its unique construction. A construction different from that of any other battery made. Not made different just to be different, but a construction that assures low operating costs and a long, active life of absolute dependability in every type of industrial truck and marine service. The pencil points to the positive plate of the Ironclad cell.

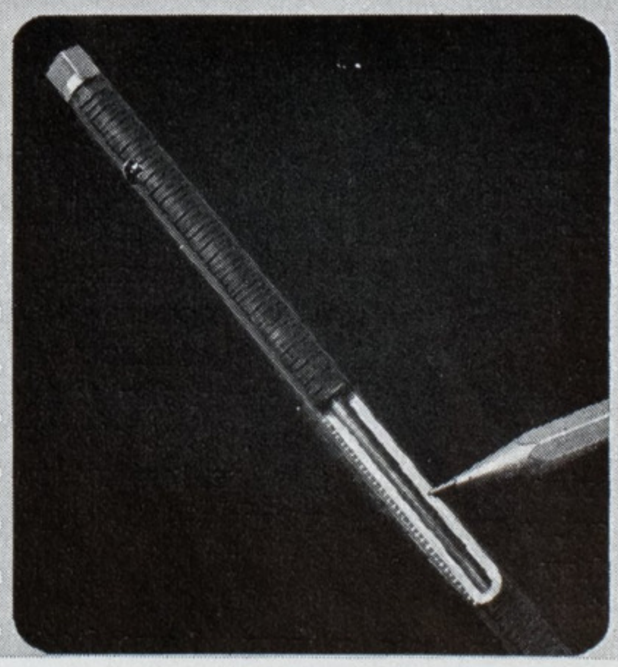


ONE OF THE REASONS for the long, economical life of the Exide-Ironclad Battery — the positive plate. Close inspection reveals a series of cylinders or tubes. These tubes are of hard rubber, ribbed front and back and horizontally slotted for their entire length. Tubes are filled with active material.

A CLOSE-UP of one of the slotted tubes of which the positive plate is composed. Immersed in liquid it shows how the electrolyte meets the active material imprisoned within the tube, through the slots in the tube but cannot wash it away. This means sustained power over an unusually long life in the toughest service, plus economy of operation. Many letters in our files from users testify to this (copies on request).



THE SLOTTED RUBBER TUBE cut away to show the active material within. Also conducting core rod running through the centre of the tube. The cylindrical construction of the tubes of the positive plate resists distortion because of the fact that expansion and contraction is equal in all directions.



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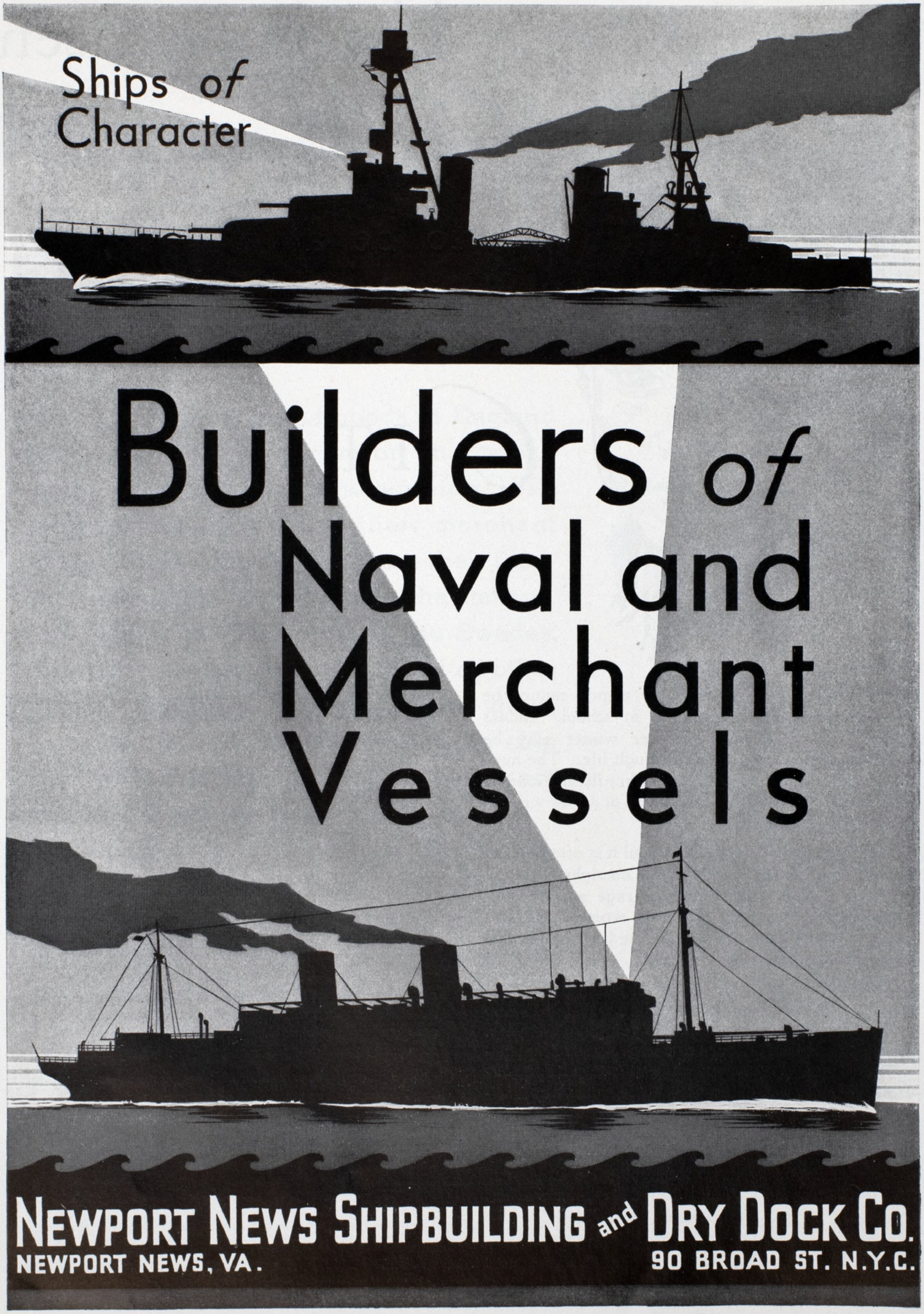
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It's *hard for a* Hungry citizen to be a Good CITIZEN

THE boy whose stomach is empty cannot be expected to do good work at school. Babies undernourished through another winter may be handicapped by frail bodies through life. The hungry father of a hungry family is hardly the man to seek employment with persistence, or to do well on the job when he gets it.

Before you can save a man's soul it is often necessary to feed his body. You have no right to expect the civic virtues of patience, courage and honesty from starving, freezing men and women. If they preserve a just attitude towards the laws of the city in which they live, it is a miracle.

This winter, as never before, it is the duty of all who are well-clad, well-housed, and well-fed to help the less fortunate. The fact that you gave last year, and the year before, does not lessen your responsibility. The fact that you cannot afford a large contribution must not deter you. The upturn of business with a gradual improvement of economic conditions does not remove the crisis of this moment. Emergency appropriations by the federal government amount to $300,000,000, but they meet only half the increased national needs for human relief.

The rest is up to you!

How will your dollars be used? First of all, they will feed the hungry, and relieve the absolute want of the unemployed.

They will be used, also, to take care of the sick and aged. They will help to maintain hospitals, orphanages and schools. They will make possible clinics and visiting nurses.

The dollars you give are invested in the forces of civilization right in your community!

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The Welfare and relief Mobilization for 1932 is a cooperative national program to reinforce local fund-raising for human welfare and relief needs. No national fund is being raised; each community is making provisions for its own people; each community will have full control of the money it obtains.

Give *through your established welfare and relief organizations, through your community chest, or through your local emergency relief committee.*

Newton D. Baker, Chairman, National Citizens' Committee

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What has Happened to Our Americanism?

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If America is to have a successful Merchant Marine, if this country is to fulfill her need for ships and the need of her ships for patronage, her citizens must begin to think of ships in terms of nationality—in terms of America.

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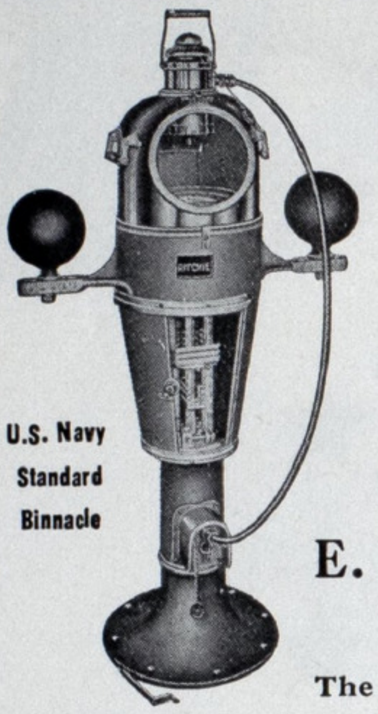

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Mail copy for your advertisement in the December issue today, so it reaches us before November 20.

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Using De Laval Geared Turbines

The new 478 ft. ships Seatrain **NEW YORK** (shown just after launching by the Sun Shipbuilding & Dry Dock Co.) and Seatrain **HAVANA**, of Seatrain Lines, Inc., can each carry 100 fully loaded freight cars at 16½ knots, making possible their arrival at New Orleans in six days from New York, after stopping at Havana. A 125 ton crane will unload and load the ship in 10 hours.

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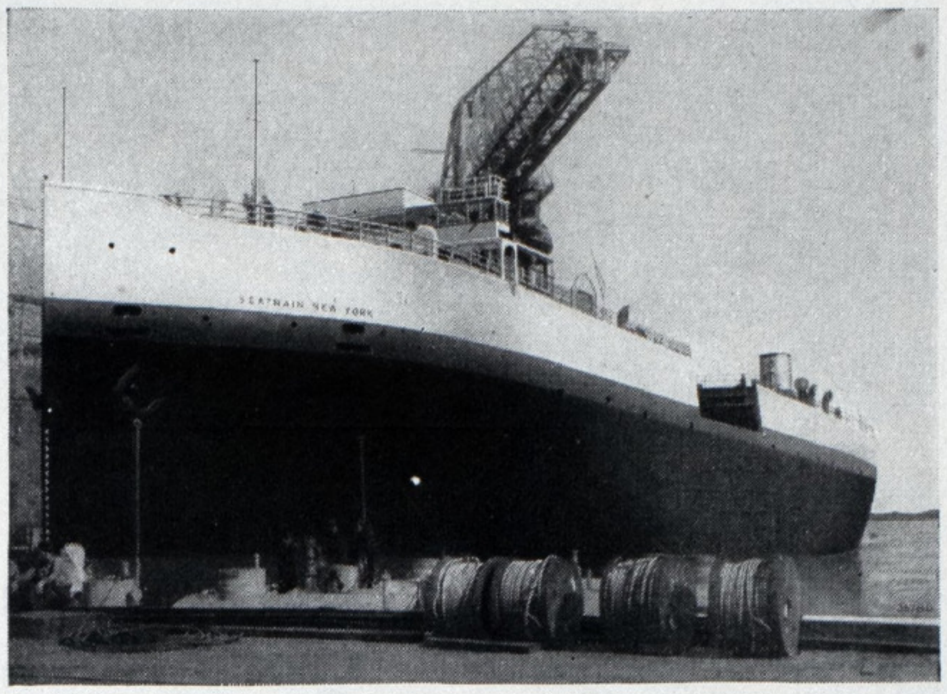

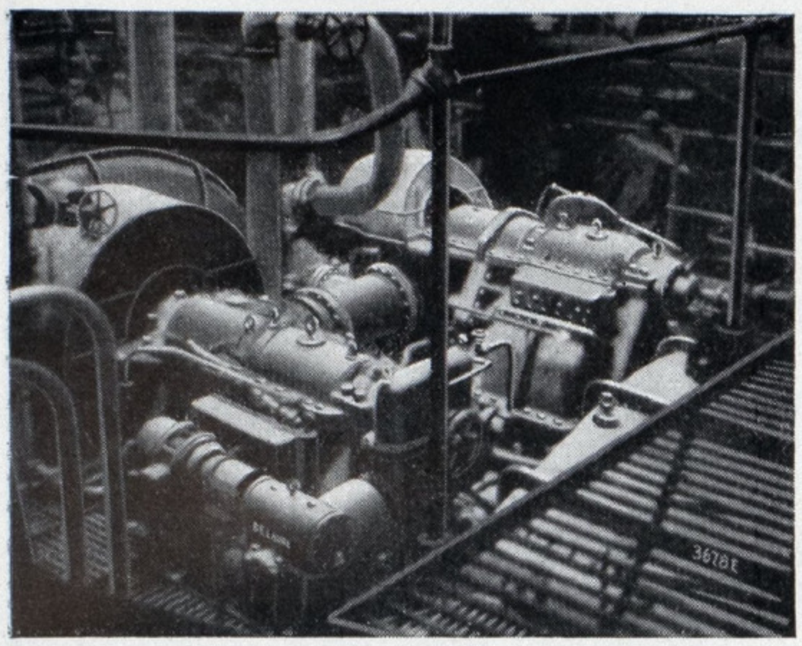

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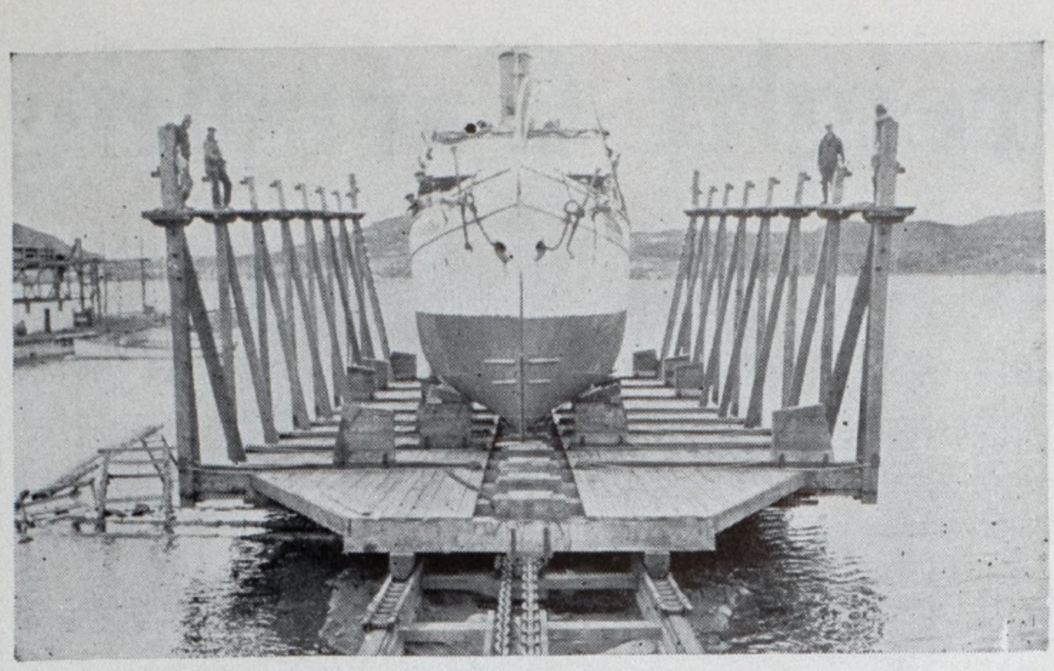

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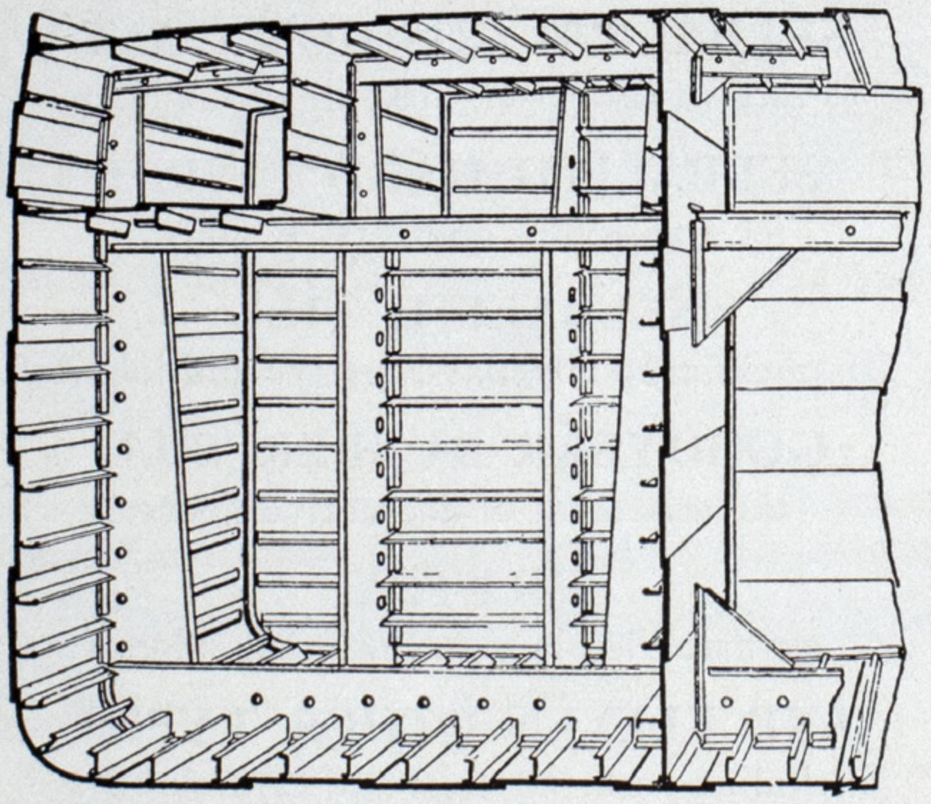

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Statement of the ownership, management, circulation, etc., required by the act of congress of Aug. 24, 1912, of MARINE REVIEW published monthly at Cleveland, Ohio, for Oct. 1, 1932, State of Ohio, county of Cuyahoga, ss. Before me, a notary public in and for the state and county aforesaid, personally appeared J. D. Pease, who, having been duly sworn according to law deposes and says that he is the Business Manager of MARINE REVIEW and that the following is to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of Aug. 24, 1912, embodied in section 411, Postal Laws and Regulations, to wit: 1.—That the names and addresses of the publisher, editor, managing editor and business managers are: Publisher, The Penton Publishing Co., Cleveland, O. Editor, A. H. Jansson, Cleveland, O.; Business Manager, J. D. Pease, Cleveland, O. 2.—That the owners are: Names and addresses of stockholders owning or holding 1 per cent or more of the total amount of stock: The Penton Publishing Co., Cleveland, O.; John A. Penton, Cleveland, O.; C. J. Stark, Cleveland, O.; J. D. Pease, Cleveland, O.; F. V. Cole, Cleveland, O.; J. R. Dawley, Cleveland, O. 3.—That the known bondholders, mortgagees and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None. 4.—That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him. J. D. Pease. Sworn to and subscribed before me this 26th day of Sept., 1932. (Seal) H. L. Richey. (My commission expires May 7, 1933).

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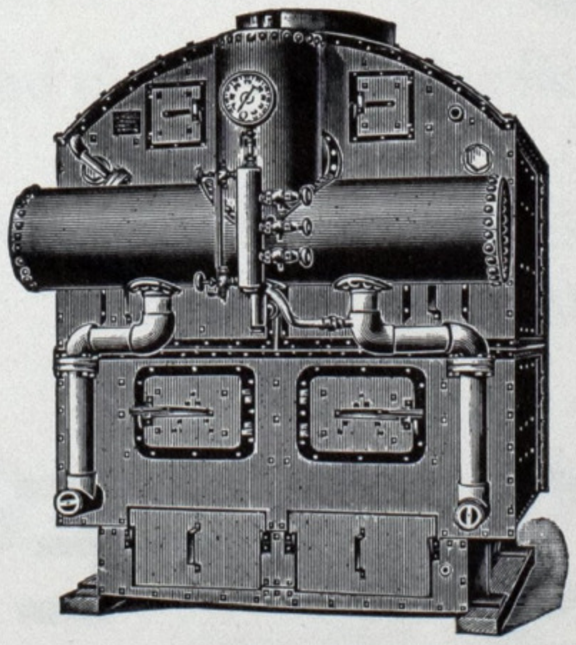

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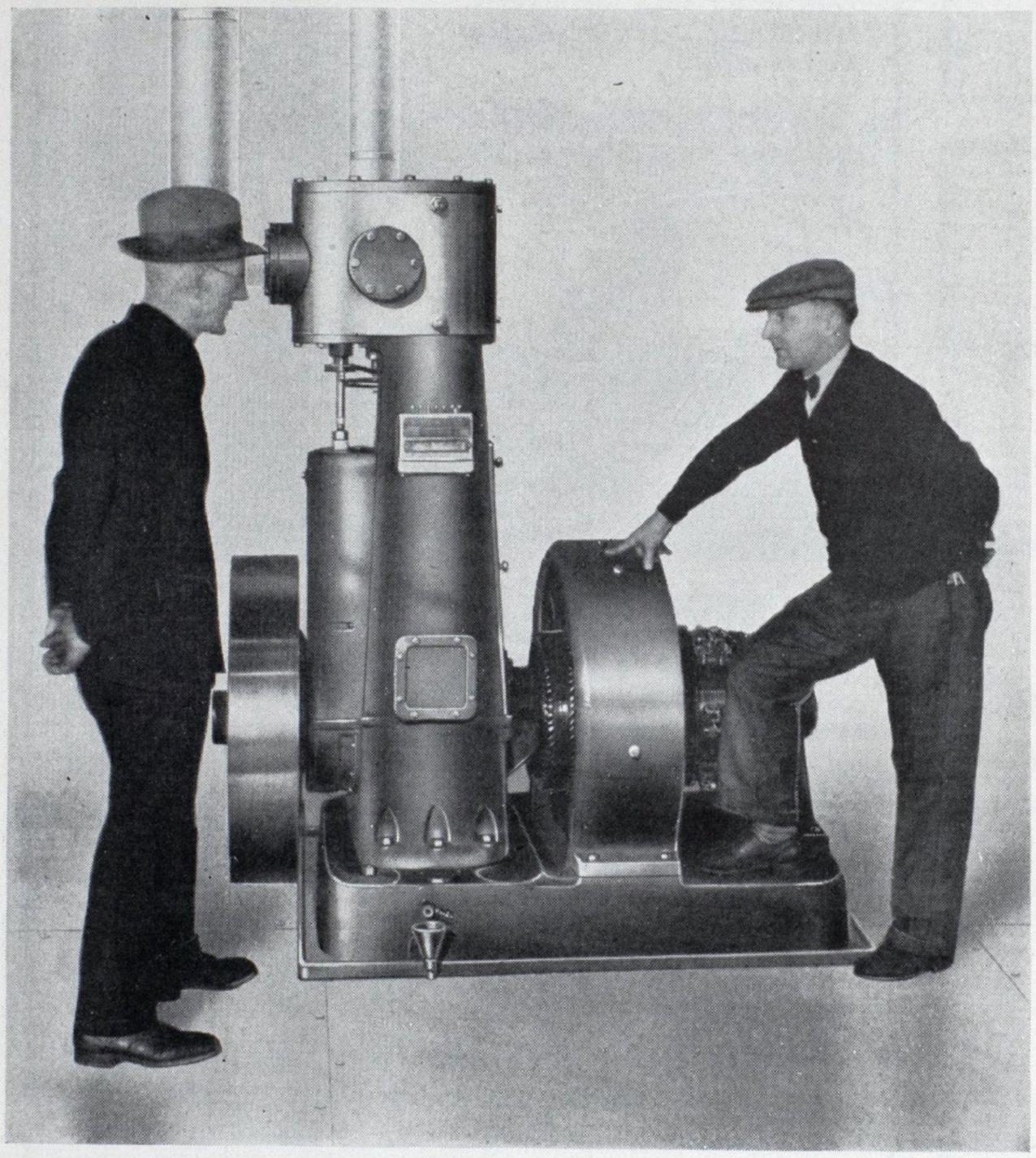

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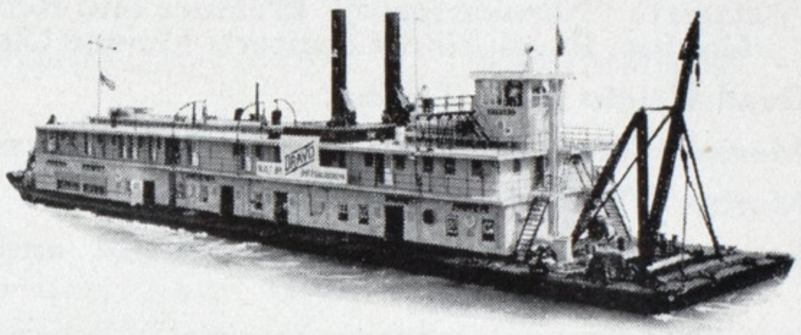

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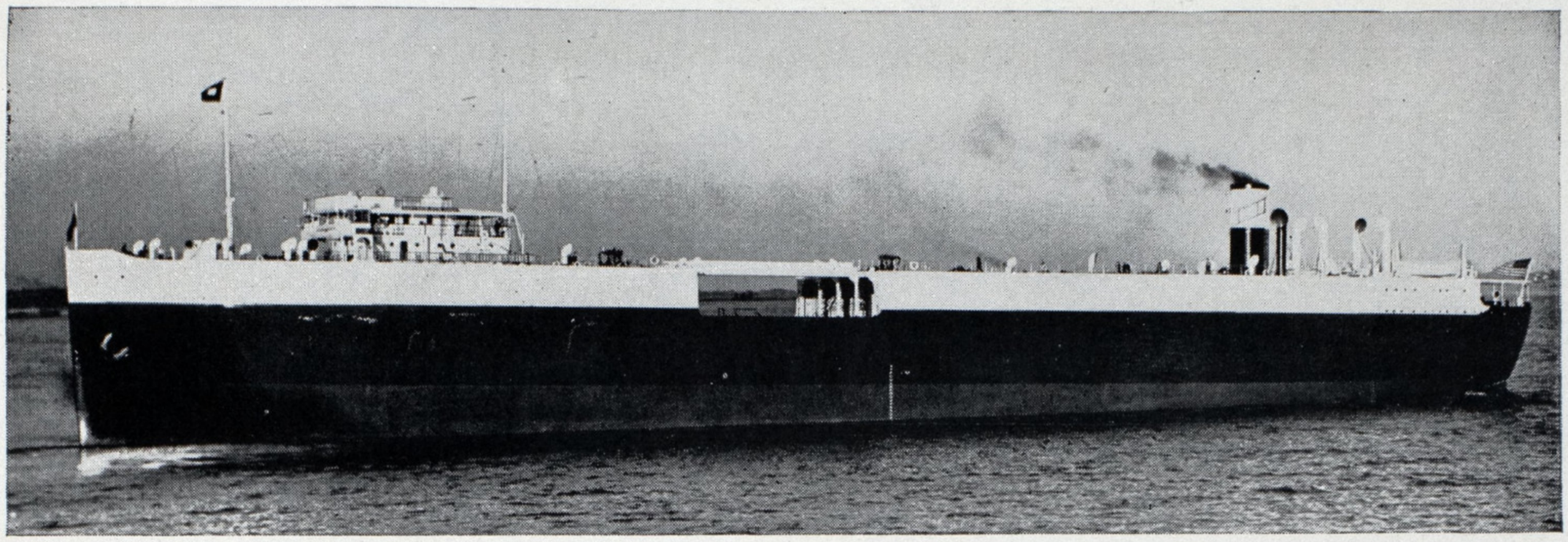

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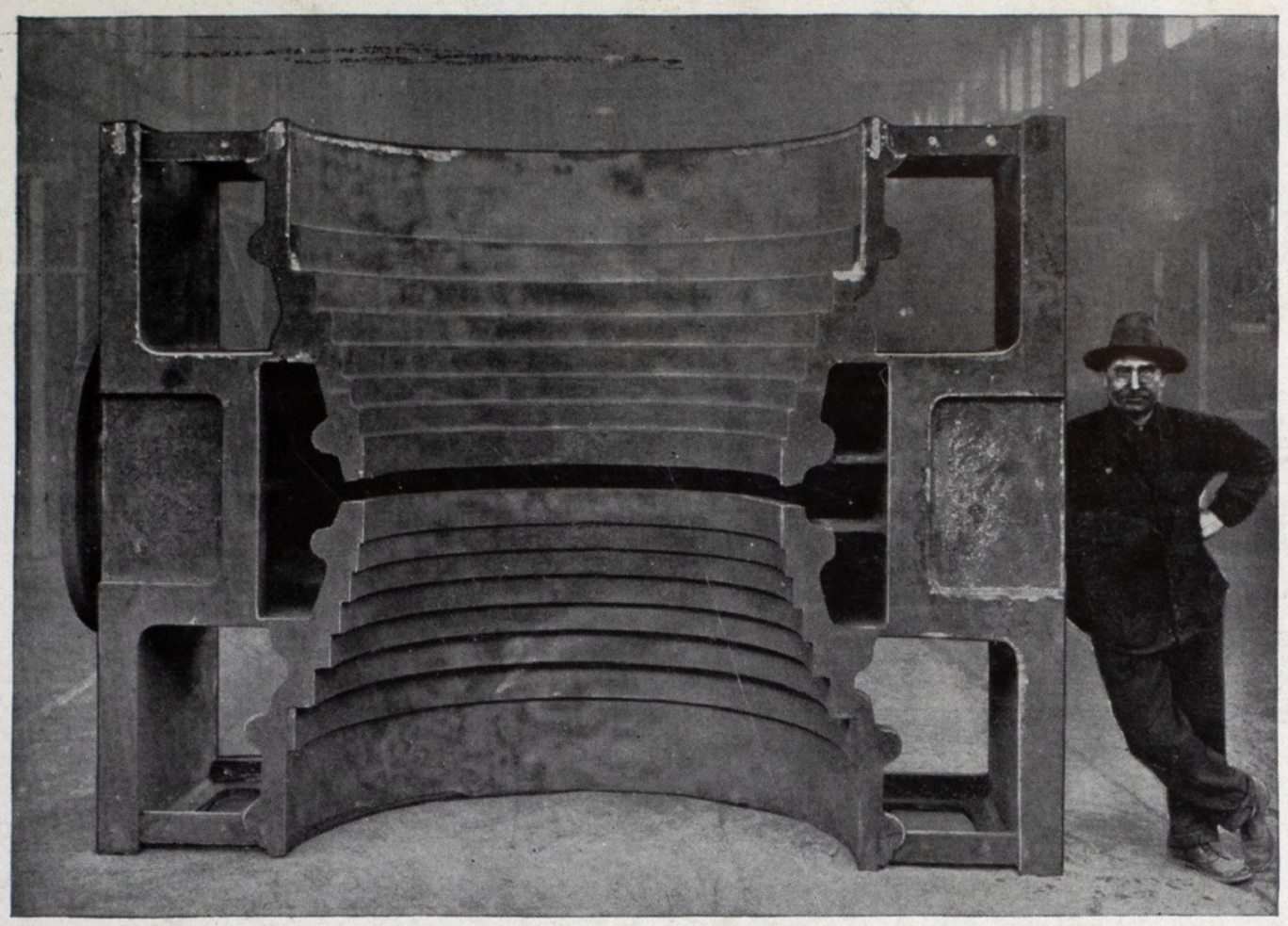

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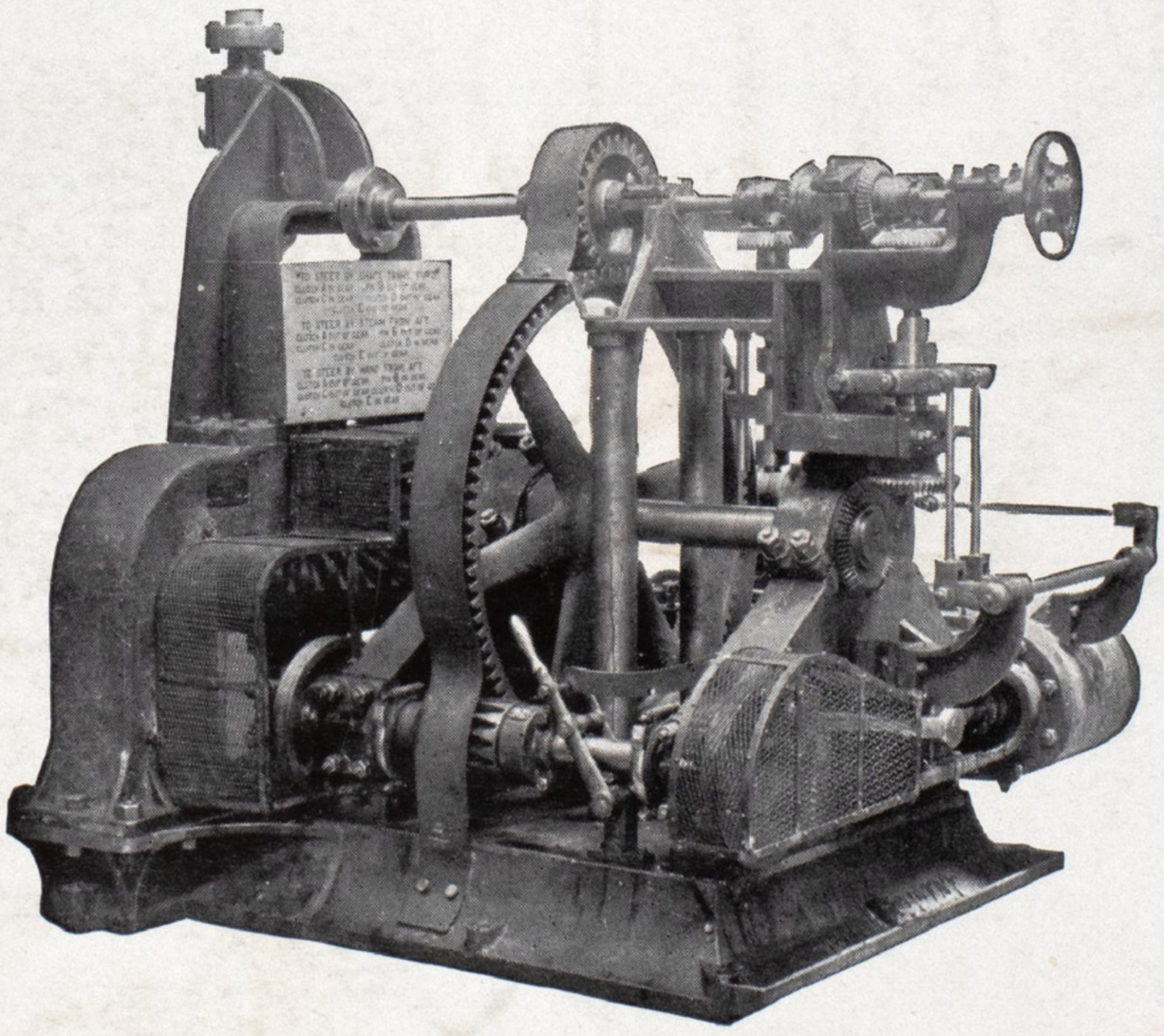

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